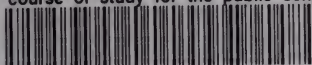


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# COURSE OF STUDY

## FOR THE PUBLIC SCHOOLS OF COLORADO

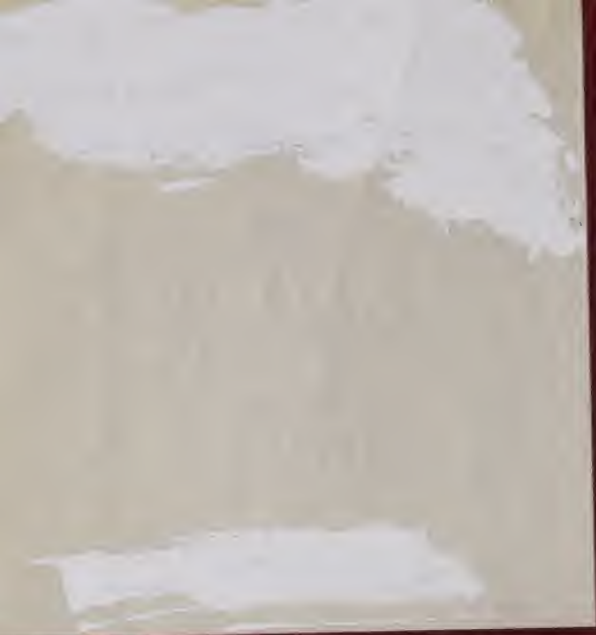
ADOPTED BY THE BOARD OF EDUCATION  
OF THE STATE OF COLORADO  
1926

Volume III  
Course for the Public High School Grades  
Ten through Twelve



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1926



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A  
COURSE OF STUDY  
FOR  
THE PUBLIC SCHOOLS  
OF COLORADO

ISSUED BY  
THE DEPARTMENT OF PUBLIC INSTRUCTION  
MARY C. C. BRADFORD, Superintendent  
1926

VOLUME III  
Outline for Senior High School Courses  
Miscellaneous



*The power to think straight, work hard, play fair, and  
love much is the test of an educated,  
efficient human being.—M.C.C.B.*

Prepared by  
MARY C. C. BRADFORD  
AND CO-OPERATING EDUCATORS  
1926  
DENVER

## NOTICE

*Teachers of Colorado:*

This volume is public property and is not to be removed from the district when you leave.

The State of Colorado provides these books, paying for them from the State School Fund. They are ordered by your County Superintendent for use by any teacher who may be in charge of the school where you are now teaching.

*Mary C. C. Bradford.*

*State Superintendent of Public Instruction.*

## FOREWORD

The Senior High School courses are in harmony with the newer plans for High School organization, and the teacher using them will receive illuminating guidance in this new functioning of secondary education.

The Senior High School course is based upon practical work now being done in some of the most successful High Schools in the state and country. Therefore, this Department offers it with the assurance that the teachers in the second and third class districts will find it a safe guide.

The appearance of some miscellaneous items, in the back of this volume, will prove of service to the teachers, as they contain matter difficult to obtain in combination.

This offering of the co-operating educators for the progress of Colorado schools is issued with the fervent hope that the teachers and pupils alike may derive from its use imaginative stimulus, scholastic enrichment, and a vitalized conception of the duties of the New Citizenship in the New Day.

*Mary C. C. Bradford.*

*State Superintendent of Public Instruction.*

## INDEX

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|                           |     |
|---------------------------|-----|
| English Literature.....   | 15  |
| Geometry .....            | 31  |
| Latin .....               | 51  |
| Spanish .....             | 73  |
| French .....              | 87  |
| Biology .....             | 93  |
| Physics .....             | 149 |
| Chemistry .....           | 161 |
| Physical Education.....   | 171 |
| Home Economics .....      | 179 |
| History .....             | 217 |
| Commercial Subjects ..... | 269 |
| Industrial Arts.....      | 327 |
| Music and Art.....        | 331 |
| Miscellaneous Items ..... | 333 |

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## SENIOR HIGH SCHOOL

Each year the American High School becomes a greater and more important factor in the making of loyal American citizens. It is no longer acknowledged to be merely a place to teach Aglebra, Latin and kindred subjects, but a place to stimulate civic pride, to encourage public intelligence and to promote the welfare of the community. The modern high school is a place to study, unbiased, the errors of the past and the problems of the future. It is a place where great leaders are in the making and where those who are to follow are trained to follow thinkingly.

Life is varied. Courses of study the aim of which is to prepare citizens for life must be varied. Today public welfare requires and demands many types of trained service. In the past our public schools have not trained to any marked degree for this varied service.

The enlargement of the elementary school and the generalization of its courses have necessarily made greater demands upon the secondary schools. This condition has placed at the threshold of the high school a greater number of young men and women seeking enlarged and more democratic courses of study. The problem of the school is to furnish in an efficient way this broader training. The course of every American High School must be such as to make that high school, in every sense of the term, A School of Opportunity.

### 1. General

A most common and fundamental misconception relative to the high school is that it is a prolongation of the elementary school, merely with new objects added. Types of teachers, division of work between them, methods of instruction, standards of discipline, the social organization of the school, its relation to community life, the material equipment of the institution, even its architectural arrangement, and the size and character of the school site—all these are to be more or less differentiated for elementary and high schools. The observations of the following pages are designed to bear briefly, but practically, upon a number of these problems as they confront the high school of less than three teachers on full time.

## II. Building and Site

Ambitious, growing communities which are planning full-course high schools in even rural portions of the state should find it comparatively easy to provide a proper site. Sometimes this will mean only an enlargement of the cramped, but well-situated, site that serves the graded school. Simply because a school is in the country, it is for several reasons not wise to rely upon adjacent private grounds for play or team athletics. After the building has been located on the site as may be deemed advisable, in the center, or well to one side, the *unobstructed level space* for organized games should be not less than *two and a half acres*, in as nearly the form of a square as it is possible to make it. The only justification for not making this provision is the belief that the high school and grammar grades will never enroll enough boys to make a baseball or football team. It may occasion surprise, but it is nevertheless a fact that the largest and most efficient rural high schools in the state are taking a strong interest in athletics and contesting successfully with urban high schools several times their own size. The power of clean, virile athletics to popularize the high school for country as well as city boys is unquestionable.

Just as the school ground may thus be made a center for neighborhood sports and outings, so the school building may, if properly designed, become the center of community social gatherings. The continuance of the older students in school will normally mean commencements and other special occasions for which considerable crowds will gather. High school buildings in the country or small town should have at least one large room for the handling of assemblages that usually cannot be housed elsewhere. One room, seated with folding chairs, may be used for both public gatherings and indoor games. But if a district can afford a building of two stories, the gymnasium may be placed directly beneath this large room. The laboratory should be large enough to accommodate at once either the largest class in the high school or the senior and junior classes combined. Places for a minimum of fifteen or twenty would be safe. This room might be on the same floor as the larger study hall or assembly room, and directly over the room for household arts, which, with the gymnasium and the quarters for manual training, would take up the basement. This would decrease expense for plumbing and utilize valuable space. Manual training benches can be made secure by imbedding their legs in the concrete floor. However, if there



is a concrete floor in the gymnasium it should be covered with a wooden one to remove danger of serious accident.

In other respects the requirements for a high school building are not unique. Lighting, heating, ventilation, water supply and toilet accommodations are covered by rules that have been repeatedly formulated. An important principle to be apprehended by boards of education, that all our school buildings may be better fitted to the demands, is the necessity of a co-operation of three parties: (1) the school board, which presumably knows the financial capacity and future educational needs of the district; (2) the architect, whose technical knowledge should guarantee the safety and permanence of the building; (3) the superintendent, or principal, who knows the difference between a school house and other structures. Architects and school directors often ignore school people completely in the execution of building plans, and proceed to most costly and glaring mistakes.

### III. Furniture and Equipment

Many types of school furniture are obtainable. Funds will determine whether the more costly adjustable seats and desks shall be purchased; but this expense is unwarranted unless the adjustment to the pupil is made intelligently at stated intervals. Pupils ordinarily will not request that desks or seats be adjusted since through their whole school life they have learned to take things much as they find them. The use of chairs with stationary arms for writing, or recitation benches with stationary writing arms at intervals, is increasing for recitation rooms. For the study hall single desks should be arranged for, in three different sizes, on account of the wide physical range of the students. Blackboards can profitably run much higher than in the grammar grades.

Tables for the sewing or for the science work, the chemistry desk and perhaps manual training benches can be built more cheaply at home in isolated localities than they can be shipped in from factory or retailer. Fifty per cent. has been saved in this way by some districts where labor and lumber are plentiful. Home-made benches for manual training sometimes do not give satisfaction, because they are not constructed in a thoroughly substantial manner.

Apparatus of much value for physics especially can be contrived by student, teacher or janitor. Some schools hire a compe-

tent carpenter to care for the building, and he proves a great asset. It is not suggested that the students shall in any large degree manufacture apparatus for their experiments. Teachers in charge must decide how far to carry this plan. Students may waste a great deal of time in making apparatus that yields very poor results.

For the biological sciences, one compound microscope is probably enough. A few slides prepared by students, if not highly satisfactory, are reported by those who have tried this method as meaning much to the students. There should be enough dissecting sets and hand microscopes to go around. For agriculture, a Babcock tester should occupy the central place. For chemistry, sets of chemicals are furnished by the various supply houses. The work in physiography or geology will be helped by the collection of four hundred minerals sent free by the State Geological Survey to high schools which will furnish a suitable case for it. Bulletin No. 6 of the Survey, and the topographic and geologic maps of the state, all forwarded at low cost, are other important aids.

Physics shows the worst blunders in the expenditure of money for apparatus. Not a few schools have started by investing their whole appropriation for this purpose in a frictional machine and an air pump. These mechanisms are very interesting for some class demonstrations, but they easily get out of order. At best they can aid in the exemplification of a very few principles; yet for their joint cost apparatus could have been bought that would take a student through a very fair course in experimental physics. The instructor must fight constantly the temptation to use his appropriations for this department on high-priced apparatus that will yield spectacular results in class demonstration. The real demand, as the class enlarges, is for duplicates of the simple pieces used in laboratory experiments. The custom of assigning at once as many experiments as there are pairs of students in the class, and compelling each pair to work the experiments through in a different order because there is only one piece of each kind of apparatus, is highly wasteful of a teacher's time and energy. It requires him to do several times what he should do only once.

All standard school furniture and scientific equipment are manufactured by many firms. Some careful comparison of their products and prices has its advantages, financially and otherwise.



#### IV. The Course of Study

The length and breadth of the course of study will depend on the distance from other schools and the ability of the district to assume additional financial burdens for education. A high school worthy the name is a costly article. The smaller the school, the greater the cost per student. Its teachers are the highest paid in the school; they teach the fewest, and normally the smallest, classes. Unless the elementary schools of a district are above the average of their neighbors, the expediency of a high school is doubtful. It is wrong to impoverish or rob the great body of the children for the benefit of a few.

The distance from other high schools, as complicated by topography and transportation facilities, is very important. Local pride, the determination to have everything brought to our very doorstep, is responsible for some poor and uneconomical high schools in Colorado. Cost of transportation to another school is to be compared with that of instruction at the home school. If neighboring schools are too far for children to be transported daily, a short-course high school may be established, at the completion of which students are urged to attend the school in an adjacent district. Only the more mature will then have to forego home influence. Generally speaking, there is no warrant for a two-year school within five miles of a similar or larger school, or for a small four-year school within ten miles of a similar or larger school. Theoretically, if zones be laid off, parcels-post fashion, from standard high schools, one would, in traveling outward across the zones, first reach one-year and two-year schools, later on four-year ones.

A typical difficulty in short-course schools is the tendency to expand year by year and to disregard fixed courses of study. Many have never had a course of study. Students are carried on from year to year as long as they desire to come, and taught whatever they elect. Schools with only one or two teachers in the district cannot afford to do this. Classes for less than three students are rarely justified, and no high school classes whatever should be taught in one-teacher districts where there are over four different grades to handle. Of course, if the enthusiasm of teachers leads them to do these things outside of the regular school day, nothing should be said about it by county superintendents or others in authority. The teacher is the only one who then can object, and must be left to protect herself. A course of

study should be adopted and adhered to fairly rigidly. There should be a suitable correlation of the course in a little school with that of its larger neighbors, to the end that transfers of students from school to school may be made without loss. Like texts in adjacent schools can also be argued for, but not so strongly. Uniformity and vitality have been introduced into seven one-year schools and two two-year ones in one county by a county superintendent who has secured the adoption of a course which fits in with that of the large high school at the county seat. Monthly outlines of the ground to be covered have been sent out with the assistance of the teachers in the larger school, and the questions in their monthly examinations have also been placed before the students in the little schools. Possibly this procedure involves a trifle too much of centralization and too little of adaptation, but it is far better than the framing of courses each fall by accident.

Small high schools appear disposed to offer too many rather than too few subjects. To illustrate, one Colorado high school of two teachers and about forty students offers seven sciences; another with nearly forty teachers and over a thousand students offers three. With a few certain sciences chosen, teachers can be selected with reference to their preparation for those subjects. Investment in equipment can be effectively centered, instead of being spread over perhaps twice the ground it can cover. Diversity of curriculum is defended by some teachers in small schools, because it allows the majority of the class to elect what they please. It is pertinent to inquire, in such a case, what shall be said of the minority of the class who must be governed by the choice or whim of the majority, and whether a class is better served by a subject chosen by themselves, and for which the teacher and laboratory are not equipped, than by one selected for them and handled by a well-prepared teacher with good material equipment.

## V. The Daily Schedule

Good results can usually be secured by having daily meetings of all classes. The college plan of courses that meet twice or three times a week allows too much leakage between successive recitations. An exception can be made for household arts and manual training. For these little or no outside preparation is required, so that nearly all is in the nature of laboratory work. Students cannot get out material, tools, and utensils for starting, and then "clear decks" at the close of the hour, so as to make

satisfactory progress in a single period. Double periods\* twice a week are more profitable. Physics and chemistry, too, should be placed on a sound basis by giving double periods twice a week in the laboratory, and single periods the other days in recitation. Students may then be expected to prepare note books immediately after each experiment is performed, and to a great extent under the eye of the instructor.

Much has been said and written on the arrangement of the different subjects in the daily schedule. Less is known about it now than was thought to be known ten years ago. A good program for some schools might be a very poor one for others. Recitations should be distributed fairly over the whole day for all pupils, since there is a tendency to waste time and to become fatigued during long study periods. The afternoon session should be the lighter, if not the shorter. Double periods in laboratory or vocational studies can well come the last of the day, holding, if necessary, somewhat after dismissal of students not concerned. Practical considerations—such as the habit of tardiness in a student body, or frequent requests from parents that children be excused after their last class—may dictate the arrangements of a program that shall give nearly all pupils, or pupils from certain families, a recitation at the first and last hours of the day. A morning session from about 9 to 12 o'clock, and an afternoon one from 1 to 3:30 p. m., will fit in most places.

Since pupils elect subjects in various combinations, no daily program can make study and recitation periods alternate regularly for all students, nor is it desirable that such condition be brought about. But the least mature students can stand least inconvenience in this respect. Hence, the schedule for the ninth grade might be worked out first in well-balanced form. Some investigation will show that many high school boys and girls have no regular study program of their own. Supervision along this line may be made very beneficial.

Our future high school students will be strictly a democratic body, and the future high school must train the world for the duties of democratic responsibilities.

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\* The expression, "double periods", as used herein, always means two successive periods.



**OUTLINE**  
**OF**  
**ENGLISH AND LITERATURE**





**ENGLISH AND LITERATURE****Tenth Grade**

Literature 3/5—Oral Expression 1/5—Composition 1/5.

**ORAL EXPRESSION**

Say as little as possible about oral themes, English, etc. Get the pupil to talking, to following a simple plan in his delivery, and work out details later. Continue in the uses of the exercises suggested for the first year till he has developed them into habits. Give the time to practice the difficult sounds, to the final "s," for example, to accurate pronunciation of words, to proper posture and graceful and natural action.

The following may be suggestive:

- A. Short talks on subjects of interest to the pupil.
- B. The natural and simple interpretation of memorized selections from the best prose and poetry.
- C. Controversial topics are excellent.
- D. Description and narration may be used but lay emphasis on exposition and argument.
- E. Draw as many topics as possible from the vocational field.
- F. Dramatic presentation of interesting chapters from books, short stories and plays with two or more taking part.

**COMPOSITION**

One theme per week and one lesson per week to their criticism and discussion. Continue where necessary in the use of the exercises suggested for the first year as in uniform paper, margins, indentations. Give added attention to thought, spelling, punctuation, grammar and similar details.

When the pupil has reached some proficiency in these, emphasize a list of new tricks—loose, periodic, balanced and rhetorical sentences—unity, coherence, sentence sequence, the use of the topic and summarizing sentence, sentence connections, the use of certain words and phrases in transitions between paragraphs. The pupil in writing must keep in mind constantly a definite audience.

In letter writing, after the pupil has reached some degree of proficiency, divide the class into two divisions. Have the first division prepare a more or less complicated order for goods and let the second division try to fill these orders and to answer the correspondence on the difficulties as they arise. If there are no mistakes in the letters, have the "house" make mistakes for the other side to catch. Any pupil who has had some experience in an office can cite a dozen complications that might arise. Let the divisions try to outwit each other in this game. It may continue with interest and profit for some time.

Social letters with all their variations and complication that a resourceful teacher may devise.

## LITERATURE

Choose at least two from each group for class study.

### Group I.

#### I. Plays.

Julius Caesar.

Twelfth Night.

The Tempest.

She Stoops to Conquer.

Comus.

### Group II.

#### II. Novels.

Silas Marner.

Lorna Doone.

Quentin Durward.

Pride and Prejudice.

### Group III.

#### III. Narrative Poems.

Sohrab and Rustum.

Enoch Arden.

The Eve of St. Agnes.

Tam O'Shanter.

The Tramp Transfigured.

The Prisoner of Chillon.

Atlanta's Race.

The Ancient Mariner.

Memorize at least one hundred-fifty lines per semester.



## READING LIST

Each pupil must earn at least 36 points.

## Junior Reading List

| Author                     | Book  |
|----------------------------|---|
| Addams, Jane .....         | 6 Twenty Years at Hull House.   |
| Antin, Mary .....          | 6 The Promised Land.  |
| Barrus, Clara .....        | 4 Our Friend John Burroughs.  |
| Franklin, Benjamin .....   | 6 Autobiography.  |
| Keller, Helen .....        | 6 The Story of My Life.   |
| Nicolay .....              | 6 Boy Life of Lincoln.  |
| Muir, John .....           | 6 Story of My Boyhood and Youth.  |
| Richards, L. E.....        | 6 Life of Florence Nightingale.   |
| Hagedorn .....             | 6 Boys' Life of Roosevelt.  |
| Washington, Booker T...    | 6 Up From Slavery.  |
| Grayson, David .....       | 6 Great Possessions; 6 Adventures in Contentment.   |
| Hall .....                 | 6 How to Get a Position and How to Keep It.   |
| Hawthorne, Nathaniel ..... | 6 Twice Told Tales; 6 The Scarlet Letter; 6 Mosses from an Old Manse; 6 The House of Seven Gables; 6 The Marble Faun. |
| Hearn, Lafcadio .....      | 6 Out of the East; 6 Glimpses of Unfamiliar Japan; 6 Two Years in the French West Indies.                             |
| Harte, Bret .....          | 4 The Luck of Roaring Camp.   |
| Irving, Washington .....   | 6 Tales from the Alhambra; 6 The Life of Goldsmith.   |
| Austen, Jane .....         | 6 Pride and Prejudice.  |
| Barrie, J. M.....          | 4 The Little White Bird; 4 The Little Minister; 4 A Window in Thrums.   |
| Blackmore, R. D.....       | 6 Lorna Doone.  |
| Bunyan, John .....         | 6 Pilgrim's Progress.   |
| Conrad, Joseph .....       | 4 Youth.  |
| De Quincey, Thomas.....    | 6 Joan of Arc.  |
| Dickens, Charles .....     | 6 David Copperfield; 6 Dombey and Son; 6 Our Mutual Friend.   |
| Eliot, George .....        | 6 Adam Bede; 6 Middlemarch; 6 The Mill on the Floss.  |

| Author                    | Book  |
|---------------------------|---|
| Doyle, Conan .....        | 6 The White Company.  |
| Glasgow, Ellen .....      | 6 The Battleground.   |
| Goldsmith, Oliver .....   | 6 The Vicar of Wakefield.   |
| Hardy, Thomas .....       | 6 Under the Greenwood Tree.   |
| Hugo, Victor .....        | 12 Les Miserables; 6 Ninety Three.                                    |
| Hope .....                | 4 The Prisoner of Zenda.  |
| Kipling, Rudyard .....    | 6 The Light that Failed; 6 Kim.                                       |
| Kingsley, Charles .....   | 6 Westward Ho; 6 Hypatia.   |
| Lytton, Bulwer .....      | 6 The Last Days of Pompeii.   |
| Meredith, George .....    | 6 The Ordeal of Richard Feverel; 6<br>Diana of the Crossways.         |
| Train, Arthur .....       | 6 His Children's Children.  |
| Ruskin, John .....        | 8 Sesame and Lillies.   |
| Scott, Sir Walter.....    | 6 Kenilworth; 6 Ivanhoe; 6 Guy Man-<br>nering.                        |
| Stevenson, R. L.....      | 6 Kidnapped; 6 Travels with a Don-<br>key; 6 Dr. Jekyll and Mr. Hyde. |
| Swift, Dean .....         | 6 Gulliver's Travels.   |
| Thackeray, William .....  | 6 Vanity Fair; 6 The Virginians; 6<br>Henry Esmond; 6 The Newcomes.   |
| Aldrich .....             | 4 The Story of a Bad Boy.   |
| Howells, William Dean..   | 6 The Rise of Silas Lapham.   |
| Clemens, S. L.....        | 6 Innocents Abroad; 6 Roughing It.                                    |
| Steiner .....             | 6 On the Trail of the Immigrant; 6<br>From Alien to Citizen.          |
| Shaw, Anna H.....         | 6 The Story of a Pioneer.   |
| Irving .....              | 8 Oliver Goldsmith.   |
| Bachelor .....            | 6 A Man for the Ages.   |
| Barrus, Clara .....       | 4 Our Friend John Burroughs.  |
| Quick .....               | 6 Bandermark's Folly.   |
| Riis .....                | 6 The Making of an American.  |
| Rihbany .....             | 6 A Far Journey.  |
| Roosevelt, Theodore ..... | 6 Theodore Roosevelt's Letters to His<br>Children.                    |
| Parkman, Mary .....       | 6 Heroines of Service.  |
| Cervantes .....           | 6 Don Quixote.  |
| Kaufman .....             | 6 Plutarch's Lives.   |
| Muir, John .....          | 6 My Boyhood and Youth.   |
| Du Bois .....             | 6 The Soul of the Black.  |

| Author           | Book   |
|------------------|--|
| Eastman .....    | 6 The Indian of Today.                                       |
| Crawford .....   | 6 A Roman Singer; 6 Mr. Isaacs.                              |
| Farnol .....     | 6 Geoffrey; 6 The Broad Highway; 6<br>The Amateur Gentlemen. |
| Harrison .....   | 6 Queed.   |
| Howells .....    | 6 A Modern Instance; 6 A Minister's<br>Charge.               |
| Hutchinson ..... | 6 The Happy Warrior.   |
| Locke .....      | 6 The Septimus.  |
| Parker .....     | 6 The Seats of the Mighty; 6 The Right<br>of Way.            |
| Steele .....     | 6 On the Face of the Waters.                                 |

### Travel and Adventure

| Author              | Book  |
|---------------------|---|
| Dana .....          | 6 Two Years Before the Mast.  |
| Du Chaillu.....     | 6 In African Forest and Jungle.   |
| Franack .....       | 6 A Vagabond's Journey Around the<br>World.   |
| Garland .....       | 6 Boy Life on the Prairie.  |
| Hearn .....         | 6 Glimpses of Unfamiliar Japan; 6 Out<br>of the East; 6 Two Years in the<br>French West Indies. |
| Lauder, Harry ..... | 6 A Minstrel in France.   |
| Lummis .....        | 6 Some Strange Corners of Our Coun-<br>try.   |
| Muir .....          | 6 Steep Trails; 6 Travels in Alaska.  |
| Peary .....         | 6 My Arctic Journal.  |
| Roosevelt .....     | 6 African Game Trails; 6 The Winning<br>of the West.  |
| Schauffler .....    | 6 Romantic America.   |
| Smith, F. H.....    | 4 Gondola Days; 4 A White Umbrella<br>in Mexico.  |
| Steffanson .....    | 6 My Life with the Esquimaux.   |
| Stevenson .....     | 6 Travels with a Donkey; 6 Amateur<br>Emigrant.   |
| Taylor, Bayard..... | 6 Views Afoot; 6 By-Ways of Europe.   |
| Twain .....         | 6 Innocents Abroad; 6 Roughing It.<br>6 Equator Books.  |

| Author        | Book                                |
|---------------|-------------------------------------|
| Van Dyke..... | 6 Out of Doors in the Holy Land.    |
| Palmer .....  | 6 Russian Life in Town and Country. |

### Fiction and Non-fiction

| Author                    | Book   |
|---------------------------|--|
| Allen, James Lande.....   | 4 A Kentucky Cardinal; 6 A Cathedral Singer; 6 A Sword of Youth; 6 Choir Invisible.                          |
| Bacheller, Irving .....   | 6 The Light in the Clearing; 6 Eben Holden; 6 D'ri and I.  |
| Blackmore .....           | 6 Lorna Doone.   |
| Brassey .....             | 6 Voyage of the Sunbeam.   |
| Churchill, Winston .....  | 6 The Crisis; 6 Richard Carvel; 6 The Crossing.  |
| Cooper .....              | 6 The Last of the Mohicans.  |
| Crawford .....            | 6 Saracenesca.   |
| Connor .....              | 4 Black Rock.  |
| Chesterfield .....        | 4 Girls and Women.   |
| Dickens, Charles.....     | 6 Nicholas Nickleby; 6 The Old Curiosity Shop; 6 Little Dorrit; 6 David Copperfield; 6 A Tale of Two Cities. |
| Doyle, Conan.....         | 6 The White Company.   |
| Duncan, Norman .....      | 4 Dr. Grenfell's Parish; 4 Dr. Luke of the Labrador.   |
| Eggleston, Edward.....    | 4 The Hoosier Schoolmaster.  |
| Fisher, Dorothy Canfield  | 6 Home Fires in France; 6 The Squirrel Cage; 6 The Bent Twig.  |
| Ford, Paul Leicester..... | 6 Janice Meredith; 6 The Honorable Peter Sterling.   |
| Fox, John .....           | 4 The Little Shepherd of Kingdom Come.   |
| Hawthorne, Julian.....    | 6 Life of Hawthorne.   |
| Howells .....             | 6 The Rise of Silas Lapham.  |
| Hale .....                | 6 Light of Two Centuries.  |
| Irving .....              | 6 The Life of Goldsmith.   |
| Kingsley, Charles.....    | 6 Westward Ho; 6 Hypatia; 6 Brushwood Bay; 6 Man Who Would be King.  |
| Kipling, Rudyard.....     | 6 Keni; 6 The Light That Failed; 6 Collection of Verse.  |
| Lytton, Edward Bulwer..   | 6 The Last Days of Pompeii (omit if required in other courses).  |

| Author                   | Book  |
|--------------------------|---|
| Longfellow .....         | 6 Tales of a Wayside Inn.   |
| McCarthy, Justin.....    | 6 If I Were King.   |
| Mitchell .....           | 6 Hugh Wayne! 6 English Lands;<br>6 Letters and Kings.  |
| Ollivant, Alfred.....    | 4 Bob, Son of Battle.   |
| Page, Thomas Nelson..... | 6 Red Rock; 6 In Old Virginia.  |
| Scott, Sir Walter.....   | 6 Kenilworth; 6 Heart of Midlothian;<br>6 Guy Mannerling; 6 Ivanhoe; 6 The<br>Master of Ballentrae. |
| Tarkington, Booth .....  | 6 The Gentleman from Indiana; 6 Alice<br>Adams; 6 The Conquest of Canaan.                           |
| Thackery .....           | 6 Henry Esmond.   |
| Wallace, Lew.....        | 6 Ben Hur; 6 The Fair God.  |
| Walpole, Hugh.....       | 6 The Dark Forest.  |
| White, Stewart E.....    | 6 Rose Dawn; 6 The Blazed Trail.  |
| Wister, Owen .....       | 6 The Virginian.  |
| Forbrush .....           | 6 A Boy's Life of Christ.   |
| Mitchell .....           | 6 Hugh Wynne, Free Quaker.  |
| Robins .....             | 6 The Magnetic North.   |
| Stackpoole .....         | 6 Pools of Silence; 6 The Blue Lagoon.  |
| White, S. E.....         | 6 The Leopard Woman.  |
| Wells, H. G.....         | 6 The Invisible Man; 6 The Time.  |
| Johnston, M. ....        | 6 To Have and to Hold.  |
| Parker, Gilbert.....     | 6 The Seats of the Mighty.  |
| Runkle .....             | 6 The Helmet of Navarre.  |
| Fuller .....             | 6 One World at a Time.  |

### Eleventh Grade

#### COMPOSITION

One theme per week. One period per week given to the discussion and correction of theme work. Some other good text in the hand of the pupils. Long and short themes, oral and written, with material drawn primarily from texts or from experience. Give much time to the systematic organization of at least one long expository theme.

The work should cover—the suggestions, where necessary, of former years—types of exposition—explanatory descriptions—technical English—directions for setting up a machine or how to do some technical work—the expression of personal opinion—debates, and letters with all their variations. Have the pupil keep constantly in mind his audience.



The vocational motive may be used with effect. The following are suggestive:

Some Employment for Boys and Girls of My Age.

The Business Assets of Personal Appearance—Of Good Manners—Of a Pleasing Disposition.

The Most Healthful Employments.

Disappearing Vocations.

My Fitness for a Particular Vocation—Dentistry—Engineering.

College Training for Business.

The Requirements to Enter My Chosen Vocation.

Study and apply the following:

- A. Unity, coherence, emphasis in the sentence.
- B. Paragraph development by specific examples, by contrast, by comparison.
- C. The work of the great writers.
- D. The principles as suggested during former years.

## LITERATURE

### History of English Literature

Selections from this list to be read, when the respective periods and authors are studied in the history of English Literature.

#### Group I.

##### Novels.

Tale of Two Cities.

The Bent Twig.

Sir Roger De Coverley Papers.

#### Group II.

##### Poetry.

Chaucer's Arologue.

Milton's Minor Poems.

Beowulf.

Ballads—Old English.

Browning—Selections.

Tennyson—Selections.

## Group III.

## Drama.

Othello.

Macbeth.

Hamlet.

The Melting Pot—Zangwill.

The Strife—Galsworthy.

The Servant in the House—Kennedy.

## Group IV.

## Essay.

Huxley's Lay Sermon.

Essay on Robert Burns—Carlyle.

**Twelfth Grade**

Since only three years are required by most high schools and colleges, and as many pupils tire of the standard course usually offered, it is well to give some variation the last year. Much, however, depends upon the previous training and attitude of the instructors. The following are suggestive.

**First and Second Semesters**

Composition 1/5—American Literature 4/5

**COMPOSITION**

One theme per week. One period per week given to the discussion and correction of this work. A brief systematic review of the principles of composition previously studied and of commercial and social correspondence. Oral and written themes of various kinds but mainly those giving scope to a free expression of opinion such as the editorial, the expository or argumentative appeal, the formal debate and the discussion of ethical questions of interest to the pupil and also of current events. Some emphasis should be given to plot development, dramatic situations, the dialogue and the essay.

**AMERICAN LITERATURE**

It is suggested that "Three Centuries of American Poetry and Prose" by Newcomer-Andrews-Hall, or any other good collection,

or a part of the following, be used in connection with a good text on American Literature for class study.

Franklin's Autobiography.

John Woolman's Journal.

Irving—The Alhambra—Life of Oliver Goldsmith.

Bryant—Thanatopsis, The Forest Hymn and Other Selections.

Washington's Farewell Address.

Webster's Reply to Hayne.

Webster—The Completion of the Bunker Hill Monument.

Emerson—Self Reliance—Manners—Compensation.

Thoreau—Walden.

Hawthorne—House of the Seven Gables, The Marble Faun.

Lowell—Among My Books, My Study Windows.

Holmes—The Autocrat of the Breakfast Table.

Poe's Poems.

Lanier—The Marshes of Glynn.

Bret Hart—Stories.

Whitman—Selections.

### Senior Home Reading List

| Author                   | Book  |
|--------------------------|---|
| Addams, Jane.....        | 6 Twenty Years at Hull House.   |
| Aldrich, T. B.....       | 6 Marjorie Daw.   |
| Allen, James Lane.....   | 6 Two Gentlemen of Kentucky; 6 The Choir Invisible.   |
| Antin, Mary .....        | 6 The Promised Land.  |
| Barrus, Clara.....       | 4 Our Friend John Burroughs.  |
| Bacheller, Irving.....   | 6 A Man for the Ages.   |
| Bok, Edward.....         | 6 The Americanization of Edward Bok.  |
| Cable, G. W.....         | 6 The Grandissimes.   |
| Cather, Willa .....      | 6 My Antonia; 6 The Song of the Lark; 6 One of Ours.  |
| Churchill, Winston ..... | 6 Richard Carvel; 6 The Crisis; 6 The Crossing; 6 A Far Country; 6 Inside the Cup.              |
| Clemens, S. L.....       | 4 A Connecticut Yankee at King Arthur's Court; 4 Innocents Abroad; 6 The Prince and the Pauper. |
| Conrad, Joseph.....      | 6 Typhoon; 4 Youth; 4 Tales of Unrest.  |
| Cooper, J. F.....        | 6 The Last of the Mohicans; 6 The Pilot; 6 The Pathfinder; 6 The Spy.                           |
| Davis, R. H.....         | 2 The Bar Sinister; 4 Van Bibber.   |
| Deland, Margaret.....    | 4 Old Custer Tales; 6 The Iron Woman.   |



| Author                               | Book   |
|--------------------------------------|--|
| Fisher, Dorothy Canfield             | 6 The Squirrel Cage; 6 The Bent Twig;<br>6 The Brimming Cup.   |
| Franklin, Benjamin.....              | Autobiography.   |
| Freeman, Mary E.<br>Wilkins, O. .... | 4 The Revolt of Mattier; 4 Pembroke.   |
| Garland, Hamlin .....                | 6 Main Traveled Roads; 6 The Captain<br>of the Grey Horse Troop.   |
| Glasgow, Ellen .....                 | 6 The Deliverance; 6 The Battle Field.   |
| Grayson, David.....                  | 6 Great Possession; 6 The Friendly<br>Road; 6 Adventures in Contentment.   |
| Harte, Brete .....                   | 6 The Luck of Roaring Camp and Other<br>Stories.   |
| Hawthorne, Nathaniel.....            | 6 Twice Told Tales; 6 House of the<br>Seven Gables.  |
| Hearn, Lafcadio.....                 | 3 Out of the East; 6 Two Years in the<br>French West Indies.   |
| Howells, W. Dean.....                | 6 The Rise of Silas Lapham.  |
| Irving, Washington.....              | 6 The Life of Goldsmith; 6 Tales from<br>the Alhambra.   |
| Jackson, Helen Hunt.....             | 6 Ramona.  |
| Mills, Enos A.....                   | 6 In Beaver World; 6 Wild Life in the<br>Rockies; 6 The Spell of the Rockies.  |
| Muer, John .....                     | 6 Story of My Boyhood and Youth;<br>6 Travels in Alaska; 6 A Thousand<br>Mile Walk.  |
| Riis, Jacob.....                     | 6 The Making of an American; 6 How<br>the Other Half Lives.  |
| Rihbany .....                        | 6 A Far Journey.   |
| Roosevelt, T. ....                   | 6 The Winning of the West; 6 Hunting<br>Trips of a Ranchman; 6 A Book<br>Lover's Holidays in the Open; 6 Let-<br>ters to His Children; 6 African Game<br>Trails. |
| Shaw, Anna Howard.....               | 6 The Story of a Pioneer.  |
| Steiner, Edward R.....               | 6 From Alien to Citizen; 6 Against the<br>Current.   |
| Tarbell, Ida.....                    | 6 Abraham Lincoln.   |
| Tarkington, Booth.....               | 6 The Conquest of Canaan; 6 Alice<br>Adams; 6 The Gentleman from In-<br>diana.   |
| Taylor, Bayard.....                  | 6 Views Afoot.   |
| Thoreau, Henry D.....                | 6 In the Maine Woods.  |
| Wallace, Lew .....                   | 6 The Fair God; 6 Ben Hur.   |
| Warner, C. D.....                    | 6 My Winter on the Nile.   |
| Washington, Booker T.....            | Up From Slavery.   |

| Author                    | Book   |
|---------------------------|--|
| White, William Allen..... | 6 A Certain Rich Man; 6 In the Heart of a Fool; 6 In Our Town. |
| Parkman, Mary.....        | 6 The Heroines of Service.                                     |
| Caine, Hall.....          | 6 The Prodigal Son; 6 The Master of Men.                       |
| Burnett, Frances .....    | 6 Tamberon.  |
| Wilson, Margaret.....     | The Able McLaughlins.  |
| Cobb, Irving .....        | 4 Back Home.   |
| O'Henry .....             | 6 The Heart of the West.                                       |
| Norris, Kathleen.....     | 6 Mother.  |
| Hough, Emerson.....       | 6 The Covered Wagon; 4 Fifty-four Forty or Fight.              |
| Wharton, Edith .....      | 6 The Age of Innocence.  |
| Train, Arthur.....        | 4 His Children's Children.                                     |
| Zangwell .....            | 6 The Children of the Ghetto; 6 The Melting Pot.               |
| Arnim .....               | 6 Elizabeth and Her German Garden.                             |
| Lincoln .....             | 6 The Portygee.  |
| Trollope .....            | 6 Barchester Towers.   |
| Ward, H.....              | 6 The Marriage of William Ashe.                                |
| Marshall .....            | 6 The Eldest Son.  |
| Bennett .....             | 6 Clayhanger.  |
| Poole, E.....             | 6 The Harbor.  |
| Page, T. N.....           | 6 In Old Virginia; 6 Red Rock.                                 |
| Locke .....               | 6 The Beloved Vagabond.  |

(2)

## VOCATIONAL ENGLISH

## First Semester

Written work 3/5—Text Studies 2/5.

Written Work. This is primarily for those who expect to follow some phase of writing for a living. The course should not be attempted unless the instructor has had special training in this field. Daily written work primarily for publication in the school paper, the Annual, and in the local dailies and weeklies. No school event should take place without the school reporter detailed for the job. Pupils who contemplate entering one or more of the numerous essay contests should take this work. The Vocational motive as suggested for the junior year may be expanded with good results. Each pupil during the semester should prepare at least one long expository theme using the principles as outlined during previous years. Continue the more difficult phases of social and commercial correspondence. Study the short story with all its details.

Class Study. A good text on journalism may be used. Much depends upon the instructor. The better class of magazines are valuable. The Writer's Digest, monthly, \$2.00, Cincinnati, and The Editor, Weekly—\$5.00—Highland Falls, New York—both magazines for writers—are excellent to place in the hands of pupils of this class.

### **Second Semester**

(1)

#### **Public Speaking**

The aim of the course is to train for expression on such occasions as ordinarily confront the average educated man or woman. Talks—extemporaneous, prepared, toasts. Oration, Debates, Dramatics, Readings. Technique—stage presentation, voice, poise, mood. Public appearance on every possible occasion but at least once a semester.

Text Studies. A good text such as Curry's "Foundations of Expression" or Clark's "Interpretation of the Printed Page" may be placed in the hands of the pupils.

(2)

#### **Grammar**

A thorough review of Technical Grammar with a strong text in the hands of the pupils.



**OUTLINE**  
**OF**  
**HIGH SCHOOL GEOMETRY**



## HIGH SCHOOL GEOMETRY

### I. Introduction.

Pupils in high school are more immature than they were a few years ago. The subject-matter of the geometry has been changed somewhat, more emphasis now being placed upon "intuitive geometry," practical work, experimental geometry, etc. All these changes call for a modification in methods of teaching geometry. A large amount of concrete work should enrich the subject and enliven it throughout the course. Geometry differs so much from the subjects previously studied by the high school pupil, that his success in the subject largely depends upon his getting the right point of view. He must be taught how to study the subject.

Attention of teachers is called to the fact that most engineering colleges require that, of the fifteen units of high school credits required for entrance, one unit shall be plane geometry, one-half unit solid geometry, one and one-half units algebra, one unit physics, and three units foreign language. All students who expect to do work in college mathematics or college physics should take in high school the one and one-half units of algebra and at least one unit of geometry.

### II. Objectives in teaching high school geometry.

1. To introduce the subject by enough informal, intuitive, experimental, and constructive work, begun in the first year algebra course and continued through the first few weeks of the course in geometry, to make the subject vital and human.

2. "To provide the necessary familiarity with geometric ideas, forms, and relations, on the basis of which alone intelligent appreciation of formal demonstrative work is feasible." Note—The quotations in this section on objectives are taken from "The Preliminary Report of the National Committee on Mathematical Requirements."

3. To "humanize" the subject by use of practical applications to the "geometry of appreciation, geometry of forms in nature, architecture, manufacture, and industry" and by the use of improvised instruments in field work measurements and calculations.

4. To develop those powers of space relations necessary for the appreciation of life about us.



5. To foster and develop those habits of thinking which will make the powers of analysis mentioned above effective in the life of the pupil.

6. "To make the student familiar with the great basal propositions and their applications."

7. "To develop understanding and appreciation of a deductive proof and the ability to use this method of reasoning when it is applicable."

8. "To form the habits of precise and succinct statement and of the logical organization of ideas."

### III. General directions and suggestions to teachers.

1. Read the suggestions to teachers given in the syllabus for high school algebra. Many of them apply in the teaching of geometry.

2. Each new type of work (e. g., proof by superposition) should be approached carefully and concretely.

3. In teaching the first definitions in geometry, concentrate upon the most important ones and those to be used immediately. Many definitions usually given in the introduction of the text should be postponed until they are actually needed.

4. The form of the recitation should be varied according to the type of work being done. The following form of a typical recitation on theorems may be used often: (a) have each new proposition written on the board by at least two pupils; (b) while these (four or six) pupils are writing their proofs on the board, let the other pupils demonstrate orally two or three review propositions from newly-lettered diagrams placed on the board by the teacher or pupils before the beginning of the recitation; (c) one set of the written proofs at the board should now be read by pupils and carefully corrected; (d) the duplicate set of proofs may then be corrected in less detail; (e) the remaining ten or fifteen minutes of the period may be used for review, drill, or any other purpose desired. Note—It is a matter of economy and efficiency to provide for the class proper equipment in the way of strings for drawing circles, straight edges, one or two large triangles for constructing right triangles, and a large protractor, which can be made by the teacher or a handy pupil.

5. It is usually inadvisable to assign text propositions and originals for the same lesson. The best results are usually obtained by alternating the originals in groups with the proposi-



tions. It should be borne in mind that one's success in teaching geometry is measured largely by the ability of the pupils to solve original exercises.

6. The arrangement in parallel columns of steps and reasons in proofs is strongly recommended. Pupils should be required to supply an increasing number of reasons in the proofs as the course progresses. Care must be taken not to discourage the pupils by too much insistence upon rigor and accuracy during the first few weeks of the course. Do not fail to see some commendable features in a solution even when there may be several mistakes.

7. Unless the assignment for the next lesson can be given very briefly, it should be given at the beginning of the recitation period.

8. Don't talk too much. Keep yourself in the background. Keep the pupils busy thinking and acting. Do not do *anything* for the pupil which he can easily do for himself.

9. Plan your lessons carefully, but have your plans so flexible that you can adapt them to any ordinary emergencies.

10. Place emphasis upon the fundamental theorems and constructions recommended by the National Committee and listed in the outline below. Many other theorems and some assumptions should be treated informally.

11. Do not slight the work in constructive geometry, especially in the fundamental constructions, decorative designs, and practical constructive work, but be careful in the practical work to avoid technical illustrations outside the pupil's experience.

12. Give pupils definite and systematic instruction in the drawing of general figures, and in the solution of numerical exercises. Do not overlook the excellent possibilities for the use of algebra in the numerical exercises.

13. In giving review tests, it is often best to ask for only one or two complete proofs and to give several short questions on statement of theorems, drawing figures, stating plans of proofs, giving definitions, etc.

14. Plan your review lessons very carefully, being sure to give the pupil something definite and concrete to do. Thus, you might ask him to make a list of the ways of proving triangles congruent, or to draw the figures for a group of related propositions and to state the hypothesis and conclusion for each figure.

15. The recent College Entrance Examination Board syllabus states that in the examinations for college entrance in geome-

try, one-third of the questions will be "book propositions" taken from a list of about 33 "starred propositions" (these are marked with an asterisk in the lists furnished with this outline), another third will be easy originals, and the remaining third will be more difficult originals. For teachers who have pupils who expect to take these examinations, some modifications in syllabus may be obtained by writing to The College Entrance Examination Board, New York City, or to the Chas. E. Merrill Co., Publisher, Chicago.

#### IV. Outline of course of study in plane geometry.

##### 1. First semester.

- a. List of the fundamental theorems and constructions recommended for this period by the National Committee on Mathematical Requirements (hereafter referred to as The National Committee):

- (1)\*Two triangles are congruent if two angles and the included side of one are equal, respectively, to two angles and the included side of the other.
- (2)\*Two triangles are congruent if two sides and the included angle of one are equal, respectively, to two sides and the included angle of the other.
- (3)\*If two sides of a triangle are equal the side opposite them is equal.
- (4)\*To construct a triangle when the three sides are given.
- (5)\*If two triangles have the three sides of the other, the triangles are congruent.
- (6)\*If two straight lines in the same plane are cut by a transversal, making the alternate interior angles equal, the lines are parallel.
- (7)\*If two parallel lines are cut by a transversal, the alternate interior angles are equal.
- (8)\*The sum of the angles of a triangle is equal to  $180^\circ$ .
- (9)\*If two angles of a triangle are equal, the sides opposite the equal angles are equal, and the triangle is isosceles.
- (10)\*A diagonal of a parallelogram divides it into two equal triangles.

- (11)\*If the opposite sides of a quadrilateral are equal, the figure is a parallelogram.
  - (12)\*If two opposite sides of a quadrilateral are equal and parallel, the figure is a parallelogram.
  - (13)\*If a series of parallel lines cut off equal segments on one transversal, they cut off equal segments on any transversal.
  - (14)\*All points in the perpendicular bisector of a straight line are equidistant from its extremities.
  - (15)\*Converse of (14) above.
  - (16)\*The perpendicular bisector of a line is the locus of all points equidistant from the ends of a given line.
  - (17)\*All points equidistant from the sides of an angle are in the bisector of the angle.
  - (18)\*The locus of points equidistant from two given intersecting lines is the pair of lines bisecting the angles formed by the given lines.
  - (19) To construct a perpendicular to a given straight line from a given external point.
  - (20) Same as (19), except from a point in the given line.
  - (21) To bisect a given straight line.
  - (22) To bisect a given angle.
  - (23) To construct an angle equal to a given angle.
  - (24) Through a given point, to construct a line parallel to a given line.
- b. Outline of subject-matter for first period of six weeks:
- (1) First preparation for proofs (about one week): (a) definition and values of geometry; (b) important definitions emphasized, e. g., point, line angle, right angle, perpendicular, acute angle, obtuse angle; (c) nature of a proof; (d) statements and uses of axioms of equality, but not those for inequalities. Students should have plenty of practice in applying these axioms to numerical examples; (e) postulates to be used immediately; (f) easy exercises in application of definitions, postulates, etc.

- (2) Introduction continued (about one week): (a) necessity for proofs; (b) parts of a proof; (c) definitions of vertical angles, complementary angles, and supplementary angles; (d) simple constructions of angles; (e) simple proofs dealing with angles, including formal proof of the equality of vertical angles.
- (3) Preparation for proofs of congruence of triangles: (a) meaning of proof by superposition; (b) postulates needed in superposition; (c) definitions of triangle, equal angles, congruent triangles, and parts of a triangle; (d) triangles classified as to sides and as to angles; (e) experimental comparison of two triangles when three parts of one, one of which is a side, are equal respectively to the corresponding three parts of the other triangle.
- (4) Formal proof of the first two propositions in congruence of triangles, including written and oral drill using different types of figures in different positions and with varying lettering.
- (5) Preparation for proving originals based upon the first three propositions mentioned above (about one week): (a) postulates needed here; (b) analysis of steps of the proofs of the previous propositions to show the *steps to be used in working out a proof*; (c) practice in separating general statements into hypothesis and conclusion; (d) summary of methods which can now be used in (1) proving angles equal; and (2) proving line segments equal.
- (6) Proofs of easy originals, (including the proposition on the equality of the base angles of an isosceles triangle), which are based upon the propositions previously proved.

Note.—It is usually advisable to have pupils copy for reference three or four complete typical proofs (e.g., proving two line-segments equal by getting two triangles congruent).
- (7) Formal proof of congruence of two triangles when three sides of one equal respectively, etc.

- (8) Review for the period. Have pupils summarize the ways that have been learned for (a) proving two triangles congruent; (b) proving two angles equal; (c) proving two line segments equal; (d) classifying triangles. Give more practice on originals before giving the written quiz for the period.

c. Outline for second period of first semester:

- (1) Preparation for problems in construction: (a) nature of a problem; (b) how to attack a problem in construction; (c) postulates needed in constructions; (d) how to use compasses and ruler.
- (2) Easy problems in construction (bisecting angles, etc.) for about one week.
- (3) Theorems dealing with parallel lines and perpendicular lines, and right triangles (about two weeks). Divide these theorems into about three groups, following each group with originals based upon theorems in that group.
- (4) Preparation for work with quadrilaterals: (a) definitions; (b) drawing *general* figures; (c) summary of methods of proving (1) lines parallel; (2) line segments equal; (3) angles equal.
- (5) Theorems and originals dealing with quadrilaterals.
- (6) Review and quiz.

d. Outline for third period of first semester:

- (1) Theorems, construction problems, and originals on application of properties of parallel lines to triangles, angles of triangles, transversals, etc.
- (2) Angles of polygons, perpendicular bisectors of lines, and bisectors of angles. In originals dealing with polygons emphasize where possible the algebraic method of proof where the angles are represented by literal expressions.
- (3) Preparation for inequalities: (a) axioms needed; (b) methods of proving lines unequal; (c) methods of proving angles unequal.
- (4) Theorems and originals, if time, in inequalities of



sides and of angles of triangles. These theorems may be assigned to the brighter pupils only, if desired.

- (5) Theorems on concurrent lines. These, too, may be assigned for special work or postponed until the second semester.
- (6) Special problems in constructing triangles. Some instruction should be given in how to do accurate construction work.
- (7) Summary of methods of proving (a) line segments equal; (b) angles equal; (c) lines perpendicular; (d) lines unequal; (e) angles unequal; (f) quadrilaterals parallelograms.
- (8) Review exercises in rectilinear figures. It is recommended that some exercises in practical field work, using improvised instruments, be done. (In some localities an engineer's transit may be borrowed for use in this work.) See the Stone-Millis Plane Geometry, pp. 53, 54, 57, and 20 for suggestions in regard to improvised instruments, and the Palmer-Taylor-Farnum Plane Geometry, Revised, pp. 84-89 for suggestions on field work. Trips of this kind should be carefully planned and the students told in advance just what problems are to be attempted. It is usually best for the teacher to make the trip alone before taking the pupils along for work.
- (9) Final review and quiz for the semester.

## 2. Second semester of plane geometry:

- a. List of fundamental theorems and constructions recommended by the National Committee. (The meaning of the starred theorems has already been explained). The teacher should select enough subsidiary theorems and originals to round out the course properly.
  - (1)\*Equal central angles intercept equal arcs in ....., and the converse.
  - (2)\*Equal chords have equal angles in ....., and the converse of this proposition.



- (3)\*A diameter which bisects a chord which is not a diameter is perpendicular to the chord.
- (4)\*A diameter perpendicular to a chord bisects the chord and the arcs subtended by it.
- (4a)\*In the same circle or in equal circles, equal chords are equidistant from the center, and the converse.
- (5)\*A straight line perpendicular to a radius at its outer extremity is tangent to the circle.
- (6)\*An inscribed angle equals in degrees one-half its intercepted arc (of a circle).
- (6a)\*Angles inscribed in the same arc are equal.
- (7) To circumscribe a circle about a given triangle.
- (8) To inscribe a circle in a given triangle.
- (9) To construct a tangent to a given circle (both cases).
- (10)\*The area of a rectangle is equal to the .....
- (11)\*Any parallelogram is equivalent to a rectangle that that has its .....
- (12)\*The area of a triangle is equal to .....
- (13)\*The area of a trapezoid is equal to .....
- (14)\*The square constructed upon the hypotenuse of a right triangle is equal in area to .....
- (15) To construct a triangle equal in area to a given polygon.
- (16) A straight line parallel to one side of triangle divides the other two .....
- (17) If two straight lines are cut by a set of parallel lines, the corresponding segments are proportional.
- (18)\*A line which divides two sides of a triangle proportionally is parallel to .....
- (19) The bisector of an angle of a triangle divides the opposite side into .....
- (20) The bisector of an exterior angle of a triangle divides the .....

- (21)\*Two triangles are similar if two angles of one are equal respectively to .....
  - (22)\*If two triangles have an angle of one equal to an angle of the other and the including .....
  - (23)\*If two triangles have their corresponding sides proportional, they are similar.
  - (24) If two polygons are similar, they can be divided into the same number of .....
  - (25) Converse of (24) above.
  - (26) The perimeters of two similar polygons have the same ratio as any two .....
  - (27)\*The area of two similar polygons have the same ratio as the squares of .....
  - (28) The altitude from the vertex of the right angle of a right triangle divides .....
  - (29)\*If two chords intersect within a circle, the product of the segments of one .....
  - (30) To construct a line proportional to three .....
  - (31) To divide a given straight line into parts proportional to a number of .....
  - (32) To construct a polygon similar to a given polygon and having a side corresponding .....
  - (33) If a circle is divided into any number of equal arcs, the chords ....., and tangents drawn at the points of division .....
  - (34) To inscribe a square in a given circle.
  - (35) To inscribe a regular hexagon in a circle.
  - (36)\*To circumscribe a circle about any regular polygon.
  - (37)\*The area of a regular polygon is equal .....
  - (38) The area of a circle is equal to one-half of the product of .....
- b. Outline of subject-matter for first period of second semester (six weeks).
- (1) Sequence of topics: Circles with applications to central angles, arcs, chords, tangents, secants; gen-

eral theorems and exercises for originals; angle measurement; constructions with triangles and circles; loci exercises in construction; special constructions of triangles and quadrilaterals. Note.—These are substantially the topics usually covered in Book II of plane geometry.

- (2) Difficult constructions, such as drawing common tangents and difficult loci constructions, may be assigned as special work for the brighter pupils.
- (3) Subsidiary propositions. Several propositions not listed in the 38 above should be selected for this period. See the Report of the National Committee, *op. cit.*, for a suggestive list.
- (4) Suggestions on certain special topics:
  - (a) Give some construction work in drawing ornamental designs. Some of the new texts in geometry are especially rich in suggestions on this topic.
  - (b) Some of the simple properties of circles should be taken as immediate inferences without proof; e. g., radii of the same circle or of equal circles are equal, if two circles are equal their radii are equal, etc.
  - (c) The originals should be given in groups, each group following a group of related theorems. It is recommended that the construction problems be given following the theorems upon which they depend instead of postponing them until the end of the period.
  - (d) Careful introduction to the concept of the measurement of arcs by angles should be made. Make it clear that it is the *number of degrees* in the angle that is the same as the number of degrees in the arc.
  - (e) Give some definite instruction in how to choose auxiliary construction lines; e. g., a radius, a diameter, a chord, etc., should be drawn under certain circumstances.

- (f) If the indirect method of proof is used again this period, it should be prepared for carefully.
  - (g) Give a very detailed and concrete introduction to the loci exercises. Let the student in this introductory work draw a large number of easy loci without proof.
  - (h) The review work at the end of the period should include among other things a listing of the properties of arcs, chords, diameters, inscribed angles, tangents, and central angles.
- c. Second period (of six weeks) of second semester. About the same as Book III in most text books in plane geometry.
- (1) Sequence of topics recommended:
- (a) Theory of proportion. A proportion should be defined as the equality of two ratios (fractions). The National Committee recommends the discontinuance of the terms antecedent, consequent, third proportional, and fourth proportional.
  - (b) Theorems and corollaries on the properties of proportions, with numerical exercises on each.
  - (c) Theorems and construction problems applying proportions to triangles.
  - (d) Similar triangles, each proposition being followed by numerical and practical exercises, one or two lessons in practical field work are recommended.
  - (e) Similar polygons with applications to drawing to scale. If desired, a plane table for outdoor work may be improvised. See the Stone-Millis Plane Geometry, pp. 127 and 128.
  - (f) Miscellaneous and supplementary exercises in proportion and its applications.
  - (g) Summary of methods of proving two line-segments proportional.

- (h) Exercises to be solved by one or more of the following special methods:
    - (1) by use of similar triangles;
    - (2) by the use of auxiliary construction lines.
    - (3) Use of algebra, using  $x$  to represent one of the segments.
    - (4) Exercises making use of the carpenter's steel square.
  - (i) General review and quiz.
  - (2) Fundamental theorems and constructions recommended by the National Committee. See those numbered (16) to (32) under the above.
  - (3) Subsidiary theorems and construction problems. Enough should be selected to round out the course properly.
- d. Third period of second semester of plane geometry: (Subject-matter here is about the same as book IV and book V in most text books).
- (1) Sequence of topics recommended:
    - (a) Theory of measuring areas, including concepts of commensurable ratio, equivalent areas, etc.
    - (b) Theorems for *areas* of rectangles, parallelograms, and triangles.
    - (c) Numerical exercises and originals, using theorems and corollaries dealing with figures of (b) above.
    - (d) Theorems and exercises relating to areas of trapezoids, similar triangles, and similar polygons.
    - (e) Hero's formula for the area of a triangle.
    - (f) The Theorem of Pythagoras, with applications and numerical exercises.
    - (g) Constructions of equivalent polygons; e. g., a triangle equivalent to a given polygon.
    - (h) Introduction to regular polygons.
    - (i) Theorems and exercises in regular polygons.



(j) Measurement of the circle.

(k) A few lessons on trigonometric functions and their use in solving right triangles. This work may be given in the second period of the second semester if desired.

(1) General review for the year.

(2) Fundamental theorems and constructions recommended by the National Committee. (See list given under section (a) above).

(3) Subsidiary theorems and constructions: Those dealing with projections, construction of a regular decagon, and others on regular polygons are recommended. For a list, see the Report of the National Committee, *op. cit.*

## V. Solid Geometry.

1. Specific objectives (See also Objectives in teaching high school algebra under section II above).

(a) "To exercise further the spatial imagination of the student." Note.—The quotations in this section are from the Report of the National Committee, "The Reorganization of Mathematics in Secondary Education."

(b) "To give him both a knowledge of the fundamental spatial relationships and the power to work with them."

(c) To acquaint the pupil with a great many practical applications of the subject.

(d) To develop further the pupil's "appreciation of geometry in nature, architecture, manufacture, and industry."

2. Suggestions to teachers:

(a) The emphasis in this course should be shifted from logical demonstration to (1) visualization of space relations, (2) drawing of figures in three dimensions, and (3) the solution of practical problems in mensuration.



- (b) Give many exercises in computation based upon the formulas established.
  - (c) By placing emphasis upon the fundamental propositions and constructions listed by the National Committee and giving less emphasis to formal demonstration for the other propositions, much time may be saved for giving greater attention to originals and numericals and practical exercises.
  - (d) The treatment of the theory of limits should be informal. It is suggested that Cavalieri's Theorem should be *assumed* as a means of avoiding the formal theory of limits. See the Durell-Arnold Solid Geometry, p. 387.
  - (e) It is suggested that the conventional order of topics be changed in such a way that difficult space conceptions may not be introduced too fast and that the principles of plane geometry may be utilized to more advantage at the beginning of the course. See suggested sequence of topics below.
  - (f) Originals should be assigned in groups alternated with propositions in the text.
3. Fundamental theorems and constructions recommended by the National Committee. See their report, "The Reorganization of Mathematics in Secondary Education," pp. 60-62.
4. Suggested sequence in topics.
- (a) Definitions, postulates, and fundamental principles. A review of the statements of propositions from plane geometry to be used most should also be made.
  - (b) Lines and planes. Give a few lessons on projections.
  - (c) Dihedral angles.
  - (d) Polyhedral angles.
  - (e) Polyhedrons (1) prisms, (2) parallelopipeds, (3) volumes of rectangular solids.
  - (f) Special theorem: It is suggested that the following Theorem of Cavalieri be assumed as the basis for proof of the theorems on the volumes of parallel-

epiped, prism, cylinder, pyramid, and cone: *If two solids are included between two parallel planes and if each pair of sections of the two solids made by planes parallel to the including planes are equal in area, the volumes of the two solids are equal.* See suggestion under "Suggestions to Teachers" above.

- (g) Volumes of pyramids and frustrums of pyramids. Also areas.
- (h) Cylinders and cones.
- (i) The sphere: (1) General theorems and originals; (2) spherical triangles; (3) spherical volumes.
- (j) Symmetry of solids.
- (k) Review and final quiz.

## VI. Bibliography.

### 1. Books on the teaching of geometry.

- (a) For books on the teaching of high school mathematics see the bibliography in the syllabus for high school algebra.
- (b) Report of the National Committee on Mathematical Requirements, "The Reorganization of Mathematics in Secondary Education." Published under the auspices of the American Mathematical Association. Sent prepaid by the Dartmouth Press, Hanover, N. H., upon receipt of 20c for mailing costs. This is a very important document of about 600 pages. It is destined to have a very important influence upon the curricula in mathematics for several years.
- (c) Smith, D. E., *The Teaching of Geometry*. (Ginn and Co., Chicago, Illinois).
- (d) Arnold, D., *Suggestions on the Teaching of Geometry*. (Chas. E. Merrill Co., Chicago).
- (e) Touton, F. C., *The Solution of Original Exercises in Geometry*. (Bureau of Publications, Teachers College, Columbia University, New York City).
- (f) *The Reorganization of First Courses in Secondary Mathematics*, U. S. Bureau of Education Bulletin

Circular, No. 5, February, 1920, 11pp. 5c, Supt. of Documents, Washington, D. C.

- (g) Sykes, Mabel, Source Book of Problems for Geometry Based Upon Industrial Design and Architectural Ornament. Allyn and Bacon, Chicago, Ill.

2. Test in Geometry.

- (a) The Minnick Tests (for description see Report of National Committee, op. cit. pp. 381-389) Dr. G. H. Minnick, Dean of School of Education, Univ. of Penn., Pennsylvania.
- (b) Shorling, R. A., A new Type of Geometry Examination. Mr. Raleigh Shorling, 415 123rd St., New York City.
- (c) Roger, Agnes L., The Rogers Test for Diagnosing Mathematical Ability. Test Booklets \$7.00 for 100. Teacher's Manual, 50c. Tests 3 and 4 deal with geometry. Bureau of Publications, Teachers College, Columbia University, New York.
- (d) Shorling, R. and Sanford, Vera, Achievement Test in Plane Geometry. (An hour test on Plane geometry. Very comprehensive). \$2.50 per package of 25 test booklets. Teacher's Manual and score sheet, 25c. Bureaus of Publications, Teachers College, Columbia Univ., N. Y.
3. Some text books which contain excellent suggestions on method.



OUTLINE

OF

LATIN





## LATIN

This course of study is designed for the many Latin teachers who are teaching the subject because circumstances require it of them, rather than because they are well-prepared to teach it. For this reason a great deal of emphasis will be placed upon Aim and Method, as well as Content.

The ideas and the material contained in the report of the Classical Investigation have been freely drawn upon in the compilation of this course of study. Specific references have been given in some instances, but it was not possible to include all of them.

The first year course in Latin should provide a thorough groundwork in the language itself. It should not be simply a pre-Caesar course, with every effort made to train the pupil to be an excellent translator of Caesar, at the same time neglecting most of the details of pronunciation, word-building and the relation between the English language and the Latin. It is the stressing of the latter which makes the course of value to any one who takes it, regardless of how many years he may study Latin, or of what his future occupation may be.

If circumstances are such that the teacher may inaugurate the study of Latin in the second semester of the Eighth grade and continue the study of the first year book through the two semesters of the Ninth, it will be ideal. In that event more time may be spent on the very beginnings of the language, and more thorough work may be accomplished. But in the majority of cases this plan will not be feasible or possible, so it is very important that the text be as brief as is consistent with the amount of material that must be covered.

The text should contain all the essentials, presented in their proper order. It will be helpful if there are suggestions and aids for linking up the English and Latin words, as well as Latin phrases which are used frequently in English. An inexperienced teacher, burdened with a text book that is full of non-essentials, will soon become hopelessly lost in the struggle to adequately cover the great amount of necessary ground in the short time allotted for it. No text will include everything that should be contained in the course. The wise teacher will have a copy of all the best texts from which he will be able to glean helpful material to add to that which his own text contains.

## I. AIMS OR OBJECTIVES

The primary aim is to develop progressively "the power to read and understand Latin. This will involve the mastery of the elements of the language, i. e., vocabulary, forms and syntax." The relative emphasis to be placed upon these elements will vary according to the class ability and the attainment of the ultimate aim from year to year. The application of this principle will be discussed more fully under content and method.

The secondary, or more properly speaking, the Ultimate Aims, according to the report of the Advisory Committee of the American Classical League are, for each successive year of the four-year course, as follows:\*

## First Year.

1. "Increased understanding of those elements in English which are related to Latin.
2. Increased ability to read, speak and write English.
3. Development of an historical and cultural background.
4. Development of correct mental habits.
5. Development of right attitudes toward social situations.
6. Increased ability to learn other foreign languages.
7. Elementary knowledge of the simpler principles of language structure.

## Second Year.

1. Increased understanding of those elements in English which are related to Latin.
2. Increased ability to read, speak and write English.
3. Development of an historical and cultural background.
4. Development of correct mental habits.
5. Development of right attitudes toward social situations.
6. Increased ability to learn other foreign languages.
7. Elementary knowledge of the simpler principles of language structure.

## Third Year.

1. Increased ability to read, speak and write English.
2. Development of an historical and cultural background.
3. Development of correct mental habits.

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\* The Classical Investigation, part one, pp. 79-80.

4. Increased understanding of those elements in English which are related to Latin.
5. Development of right attitude toward social situations.
6. Development of literary appreciation.
7. Increased ability to learn other foreign languages.

#### Fourth Year.

1. Increased ability to read, speak and write English.
2. Development of an historical and cultural background.
3. Development of correct mental habits.
4. Development of literary appreciation.
5. Development of right attitude toward social situations.
6. Increased understanding of those elements in English which are related to Latin.
7. Improvement in the pupils' literary style."

It will be seen that the ultimate aims change, both in form and relative importance, from year to year. Let us now consider in detail these aims.

(a) "The increased understanding of those elements in English which are related to Latin" occupies first place (secondary to the primary aim of the mastery of the elements of Latin) in both the first and second year. By those "elements" we mean Latin words, phrases, abbreviations, and quotations which occur in English. The majority of Latin students are just as helpless when they encounter them in their reading as those who have studied no Latin. If, however, a definite attempt is made in the classroom to bring these elements to the front, and if these elements are learned with the meaning of their application in English *stressed*, the situation will be changed. If the textbook does not provide for this the teacher must introduce these elements whenever the opportunity is presented, and this implies much careful planning of lessons with great forethought. There must be a connection with something in the lesson at hand in order to make them most effective.

(b) The "increased ability to read, speak and write English" becomes the most important aim in the third and fourth years. The fullest development of the ability to read English with correct understanding is of fundamental importance for every boy and girl. Increased ability to read English is obviously dependent in part upon growth in English vocabulary. Because so many words are of Latin origin a thorough study of English deriva-

tives in connection with the Latin vocabulary is of great importance.

Training in adequate translation will increase the pupil's ability to speak and write correct and effective English. It will develop his power of thinking and of expressing thought "by increasing the extent of vocabulary, by rendering vocabulary more precise and accurate as an intellectual instrument, and by aiding the development of the habit of interrelating words so as to facilitate consecutive thinking and consecutive thought." \*By adequate translation we mean comprehension of the thought in Latin and an adequate expression in English of the thought so comprehended.

(c) The "development of an historical and cultural background" is next in importance. The attainment of this aim depends upon collateral reading in English to form a background for the historical material found in the passages that are translated from Latin into English. There must also be emphasis upon the thought and content of what is translated. Test questions should call for the thought and the story of the Latin that has been read.

(d) The "development of correct mental habits" is a somewhat disputed question, but investigation has shown that this is possible to a certain degree if favorable conditions as to method are provided in the teaching. Correct mental habits mean "habits of sustained attention, orderly procedure, overcoming obstacles, preserverance; ideals of achievement, accuracy and thoroughness; and the cultivation of certain general attitudes such as dissatisfaction with failure or with partial success. If these mental traits can be developed through the study of Latin and if their spread to other situations and experiences can be effected, then the importance of this objective for all pupils who are studying Latin is evident."†

(e) It is generally conceded that the purpose of the public school is to develop good citizens. The Latin teacher has no less an opportunity in this respect than the instructor in History and Civics. Those virtues which were so characteristic of the Romans, patriotism, honor, and self-sacrifice are most fitting examples to hold up constantly before the American boys and girls. These make a more vivid appeal to the pupils if they are presented to them in the character who exemplified them and in their original settings. It will be necessary for the teacher to select and interpret

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\* A. J. Inglis, "Principles of Secondary Education", pp. 472-473.

† The Classical Investigation, part one, p. 55.



the material which illustrates these traits. In this way may be developed "right attitudes toward social situations."

(f) An "elementary knowledge of the simpler principles of language construction" may be gained through the study of Latin if the teacher will stress the universal character of grammatical ideas. The pupil must be taught to form the habit of recognizing the identity of grammatical principles common to Latin and English and of recognizing these principles when they appear in the study of other languages. Obviously this will be of value in the more advanced study of Latin and of other languages.

(g) "Increased ability to learn other foreign languages" will follow as a natural result of good training in logical thinking and the memory work of Latin vocabulary and form drill. The teacher of modern Romance languages will have a much more fertile field in which to work if his pupils are good Latin students, but of course the relation between Latin and the Romance languages rests more largely upon the teachers of the latter languages.

(h) The "improvement in the literary style of the pupils' written English and the appreciation of good literature" will be obtained largely in the third and fourth years' work. The extent in the improvement in style will depend upon the extent to which pupils in their oral and written translation recognize and absorb the elements of literary technique which the Latin authors have made use of to secure artistic effects, and in their own efforts to secure similar effects in their writing.

A literary masterpiece can never be translated into another language without losing some of its effectiveness. "A full appreciation of the literary qualities of Virgil's Aeneid, for example, is to be developed, if at all, through direct contact with the poem in the language in which it is written. The ordinary pupil may perhaps benefit from this only by increasing his ability to recognize the losses involved in translation, to distinguish between degrees of inadequacy in translations, and to respond to a particularly happy rendering."\*

## II. CONTENT

The following is taken from the Recommendations of the Classical Committee in Regard to the Content of the Course in Latin.

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\* The Classical Investigation, part one, p. 68.

## A. Reading Content

### 1. In Latin

For at least the first three semesters a large amount of simple well-graded easy Latin should be included in the course and the first classical author should not be introduced, at least in unmodified form, before the beginning of the fourth semester. The first criterion to be employed in the selection of easy reading material is its relative value as a medium for developing the power to read Latin. This reading material should be abundant, repetitions, simple and varied in form, attractive in its content, and carefully adapted to the capacity of young boys and girls.

This easy Latin should, from the beginning conform to the genius of the Latin language, should illustrate the synthetical character of Latin, and should embody the essential problems of Latin word order and suspension of thought. Anglicized Latin will not provide a suitable medium for developing power to read Latin.

The second criterion for the selection of easy reading material is that the subject matter should, from the first, deal mainly with themes readily adaptable to the attainment of the historical-cultural objectives. A suggested list of the kinds of material follows:

Classical mythology.

Roman traditions and dramatic events in Roman history.

Biographical sketches.

Home life of the Romans.

Ideas of the Romans about their environment.

Example of Roman wit and wisdom.

Anecdotes and fables illustrative of Roman life and thought, particularly those which have a moral and embody the characteristic virtues of the Romans.

Legends and stories, heroic in character, such as were used by the Romans themselves to inculcate true standards of conduct, which because of their heroic quality appeal to the imagination of youth.

Stories on ancient themes which have a human appeal analogous to that found in teaching modern foreign languages.\*

The problem of finding this easy reading material has been simplified by the authors of some of the first-year and second-year

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\* The Classical Investigation, part one, pp. 123-129.



books. They have included in their books a considerable amount of adapted Latin, but not enough to fulfill all the requirements.

In accordance with the entrance requirements of the University of Colorado the following recommendations for the reading content are made :

First Year. In addition to the Beginners' book at least twenty pages of connected Latin. This material should be selected according to the criteria already defined.

Second Year. Four books of Caesar, either the first four books of Caesar's Gallic War, or an equivalent amount in selections from Caesar. "Many teachers believe that pupils find Caesar more interesting if selections are read, substantially as follows: Book 1, 1-29; Book 2, 15-28 or 1-28; Book 3, 1-29 or 7-16; Book 4, 1-38; Book 5, 1, 2, 8-23, 44, or 1-7, 24-55; Book 6, 11-28; Book 7, 43-53; 69-90, or 1-31, 34-36, 63-90. The substitutions of selections from *Viri Romae* and *Nepos* for any part of the second year's work is not encouraged, and such selections will not be accepted as a substitute for more than one book of Caesar."†

Third Year. The following orations of Cicero are recommended for the third year: the four orations against Catiline, Archias and the Manilian Law. As a substitute for two of these orations, the *Roscius* and selected letters may be offered.

Fourth Year. For the fourth year no substitutes are suggested for the first six books of Virgil's *Aeneid*.

The report of a Commission appointed by the College Entrance Board in 1925 is, in part, as follows: "The Commission believes that while Caesar, Cicero and Virgil have stood the test of time as the authors best adapted for the early years of Latin study and should, therefore, form an essential part of the study of Latin in all high and preparatory schools, teachers should be encouraged to read and have their pupils read from a wider field, according as taste or opportunity may dictate.

The Commission therefore makes the following recommendations:

- (1) (b) (1) "That in the second year the early reading be easy Latin, which may be 'made' of adapted Latin; but that not less than one semester of this year be devoted to the reading of selections from Caesar; and that the reading for the year may well include easy selections from such authors as Aulus Gellius, Eutropius, Nepos, Phaedrus, Quintus Curtius Rufus, and Valerius

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† Definitions of High-School Entrance Units, Univ. of Colo. p. 14.

Maximus, or books of selections containing some of these together with other authors of prose works.

- (2) "That in the third year, if the reading is in prose, as the commission would recommend, not less than one semester be devoted to the reading of selections from Cicero; and that the reading for the year may well include selections from such authors as Pliny, Sallust and Livy, or books of selections containing these and other authors of prose works.
- (3) "That in the fourth year, if the reading is in poetry, not less than one semester be devoted to the reading of selections from Virgil; and that the reading for the year may well include selections from such works as *Metamorphoses*, *Tristia*, *Heriodes*, and *Fasti* of Ovid, or books of selections containing poems or extracts from Ovid or from other poets."\*

(Please note that this report has not been officially approved at the time this is written, so before adopting its suggestions too freely it will be well to investigate its fate at the hands of the Board on April 10, 1926).

The recommendation of the Committee of the American Philological Association, 1910, is as follows:

"Latin required for admission to college—not less in amount than Caesar, *Gallie War*, 1-4; Cicero, *Catiline*, *Manilian Law*, *Archias*; Virgil, *Aeneid* 1-6. Amount may be selected from Caesar (*Gallie War*, *Civil War*); Nepos (*Lives*); Cicero (*Orations* and *De Senectute*); Sallust (*Catiline*, *Jugurthine War*); Virgil (*Bucolics*, *Georgics*, *Aeneid*); Ovid (*Metamorphoses*, *Fasti*, *Tristia*)."

This recommendation was formally accepted by a large number of colleges and universities of the country, and while it is not quite identical with the requirements of the University of Colorado, the department at the University does not object to its provisions.

## 2. Collateral Reading in English

Reading in English on topics bearing on the historical-cultural objectives may well be made a part of the work of each year of the course. This reading and the classroom discussion concerning it

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\* Latin Notes, March, 1926.

should have especial reference to the significance of the topics read in relation to the present-day environment of the pupil. The careful study of a very few topics will be better than a heedless perusal of many. The following list is suggestive and if the ramifications of any one are followed out they will lead to a good preliminary view of Roman civilization:

Daily life of the Romans.

Characteristic qualities and stories illustrative of them.

Religious ideas and mythology of the Romans.

Roman history and traditions: a general idea of the development of Rome, of the main periods of the history of Rome, and of important legendary or historical personages associated with them.

Topography and geography.

The government of ancient Rome.

Political, social and economic attainments of the Romans.

Significance of Rome as a whole.

Influence of Rome on Western Civilization.

The teacher should do a great deal of this work himself, as there is not adequate time for the pupil to do much. However, as a reward for the extra time the pupils may devote to it, the teacher may add a few per cent to the grade that they make on the regular work.

## **B. Vocabulary**

From 400 to 500 words should be learned in the first year of the course and approximately 500 words in each succeeding year.

## **C. Syntax**

The following order of syntax has been suggested by the Classical Committee. However, there is not, at the present time, any first-year textbook that develops syntax in exactly this order:

Agreement:

Verb with subject.

Adjective with noun.

Appositive with noun or pronoun.

Predicate noun or adjective with subject.

Case uses:

Nominative as subject.

Genitive of possession and other adnominal uses, but without differentiation or separate identification.

Dative of indirect object.

Accusative of direct object.

Accusative in prepositional phrases including those with *ad* and *in* expressing place whither, but without differentiation or separate identification.

Vocative in direct address.

Ablative of Means.

Ablative in prepositional phrases including those with *ab*, *de*, *ex*, *cum*, *in*, expressing separation, place, agent, manner, cause, accompaniment, place where, but without differentiation or separate identification.

Agreement:

Pronoun with antecedent.

Case uses:

Accusative as subject of infinitive.

Accusative of duration or extent.

Ablative of time.

Ablative of cause.

Verb uses:

Present infinitive in indirect discourse.

Case uses:

Dative with intransitive verbs as these are met.

Dative with compounds as these are met.

Accusative of place whither, without a preposition.

Ablative absolute.

Ablative of respect.

Ablative with deponents as these are met.

Verb uses:

Independent volitive subjunctive.

Subjunctive in a clause of purpose with *ut* and *ne*.

Subjunctive in a clause of result with *ut* and *ut non*.

Subjunctive in a *cum*-clause of situation.

Subjunctive in indirect questions.

Sequence of tenses as far as needed in the reading and writing.

Complementary infinitive.

Perfect and future infinitives in indirect discourse.

Case uses :

Genitive of description.

Dative of reference.

Dative of purpose as met in the reading.

Dative of possessor.

Ablative of separation without a preposition.

Ablative of description.

Verb uses :

Subjunctive in a relative clause of purpose.

Subjunctive in a *cum*-clause of cause.

Subjunctive in a subordinate clause in indirect discourse.

Infinitive as subject.

Gerundive.

Case uses :

Dative with adjectives as these are met.

Dative of agent.

Ablative of comparison.

Ablative of degree of difference.

Locative.

Verb uses :

Subjunctive in a *cum*-clause of concession.

Passive periphrastic.

Subjunctive in present and past conditions contrary to fact.

Case uses :

Genitive with adjectives as these are met.

Genitive with verbs of remembering and forgetting as these are met.

It will be necessary for the teacher to plan his work so that he can cover the syntactic content in the time allowed in his particular school.



### D. Forms

Nouns of the first and second declensions.

Adjectives of the first and second declensions.

Formation of adverbs from adjectives of the first and second declensions.

Pronouns: *quis, ego, tu, is*.

Verbs:

Indicative of *sum*.

Indicative active and passive of the first and second conjugations.

Infinitive of the first and second conjugations present active and passive.

Principal parts of selected verbs of the first and second conjugations.

Nouns of the third declension.

Adjectives of the third declension (i-stems and comparatives).

Formation of adverbs from adjectives of the third declension.

Comparison of regular adjectives.

Pronouns: *qui, hic, ille, ipse*.

Verbs:

Indicative of the third and fourth conjugations active and passive.

Present infinitive active and passive of the third and fourth conjugations.

Perfect passive participle of all conjugations.

Principal parts of selected verbs.

Nouns of the fourth and fifth declensions.

Irregularities in the declension of pronominal and numeral adjectives.

Comparison of the irregular adjectives *magnus, parvus, multus, bonus, malus*.

Verbs:

Subjunctive of *sum*.

Subjunctive active and passive of all conjugations.

Perfect infinitive active and passive and future active infinitive of all conjugations.

Present and future active participles of all conjugations.  
Gerund.

Pronouns: *aliquis* and *quisque*.



**Verbs:**

Irregularities in the conjugation of *possum*, *eo*, *fero*, *volo*, *nolo*, and *malo*.

Deponent verbs of all conjugations.

Future passive participle (gerundive) of all conjugations.

**Nouns:**

Locative.

**Verbs:**

Supine.

Again it will be necessary for the individual teacher to plan his work so that he can cover the form content in the time allowed in his particular school.

### III. METHODS

The object of the teacher is to teach Latin in order that the pupil may learn Latin and may also realize the important enduring values derivable from the study of Latin. Without training in Latin as Latin, pupils will do poorly in their attempts to make the applications of Latin. Successful results in the teaching of Latin depend more on the *thoroughness* with which it is taught than any one other factor. Knowledge of Latin by the teacher is the first and foremost requisite. No methods, however modern, can dispense with that. It is also very important that the teacher should constantly enlarge and enliven his knowledge by reading and study in addition to preparation for the daily lessons he is to teach.

#### A. Methods in Reading

The methods to be used in teaching pupils to read and understand Latin should be such as to develop in the pupil correct habits of independent study, to enlist the interest of the pupils, and to encourage the use of the facts acquired in the study of Latin in activities outside the Latin class.

A first prerequisite for the oral reading of Latin is ability to pronounce Latin clearly. This ability should be acquired through imitation and constant practice, rather than through the study of rules. Place the emphasis in teaching upon the ability to read with proper expression and with due regard to the grouping of words. The marking of all long vowels in the written work will probably require more time than the results warrant, but it is worth while to insist upon the marking of the quantities in case and personal end-

ings, and in verb form where the quantity of the vowel differs in different tenses. In the reading of Latin poetry more emphasis should be placed upon fluent and expressive metrical reading than upon the mechanics of scansion.

It is assumed that the Roman method of pronunciation will be used in the reading of Latin. However, pupils should be taught the English pronunciation of Latin words, phrases, and proper names that have been adopted into the English language.

Practice in comprehending Latin at sight should be included in the work of every recitation. In no other way can the teacher see the workings of the pupils' mind so clearly, and thus gain a means of helping the pupil with his difficulties. Either the teacher or a pupil should read in Latin with correct phrasing all passages before they are translated at sight. Practice in writing Latin should accompany the reading and oral use of Latin from the start. It helps to make the pupils' knowledge more exact and his practice correct, and helps make him more sure of himself in his reading of Latin as Latin. To test the pupils' comprehension of the thought of a sentence or paragraph use carefully prepared questions which are so constructed as to require for an answer the understanding of a whole sentence or paragraph.

There are two ways of reading Latin, namely, the Latin-order method and the analytical method. While the Latin-order method is preferable there will be times when the analytical method must be resorted to (in the interpretation of a long and difficult passage). The pupil should be made to understand the difference between this method and the reading method to be regularly employed. While the Latin-order method is far better adapted to the development of real power to read Latin as Latin, the analytical method is, at least, definite, and any definite method consistently followed will produce facility in the use of that method. Whatever method is used should be clearly explained to the pupils and they should be trained through constant practice in sight work to use the method when they are preparing their lessons.

The following "directions for translating," taken from Welch and Duffield's *Eutropius* (Macmillan), definitely exemplify the analytical method:

1. Pick out the finite verb (the predicate) and find its voice, mood, tense, number and person.
2. Find the subject or subjects with which it agrees. Translate.

3. If the verb is incomplete, find the object or completion. Translate.
4. See if the subject is enlarged by any of the methods mentioned below; if it is, translate, taking the enlargements with the subjects.
5. See if the object is enlarged; if it is, translate, taking the enlargements with the object.
6. Take the extensions of the predicate. Translate.
7. Translate finally, putting in the introductory conjunctives or other words not yet taken.

The following "Type Lesson in Sight Translation" is taken from the Pennsylvania Syllabus in Latin for High Schools (1923):

"From the beginning the pupil is led to see that he is learning to understand a Latin sentence just as the Romans did, gaining a tentative meaning of its various elements but reserving final judgment as to forms, meanings, and constructions until the end of the passage has been reached. It was, of course, impossible for a Roman, while listening to a speech, to search first for the subject, then for the object, and so on. Nor is the pupil, though just beginning the study of Latin, to be allowed to proceed in such a mechanical way.

"Let the following sentence serve as an illustration: *Caesar, his rebus impulsus, equitatum omnem prima nocte ad castra hostium mittit.* The class or individual pupil first reads the sentence as a whole, without making any effort at translation. However, while reading the Latin in this way, he makes every effort to gain its meaning. The sentence is then studied in detail. As soon as possible facts like these are elicited by means of questions to the class, all the pupils participating in the work. At the beginning of the course, the teacher might proceed as follows:

*Caesar*: Noun, nominative singular masculine, meaning 'Caesar.' Since it stands first in the sentence, and is nominative, it is probably the subject.

*his rebus impulsus*: *his rebus* naturally go together, both being in the dative or ablative plural. They are probably ablative of means with *impulsus*, since there is no possible use of the dative with the participle. It is probable that *impulsus*, being a perfect participle, in the nominative singular masculine, agrees with *Caesar*, though this can

not yet be regarded as certain. *Rebus* has so many meanings that only the context can show which is correct. Connect *impulsus* with English 'impulse' and 'impel.'

*equitatum omnem*: Case? Accusative singular masculine. Construction? Probably direct object of a verb occurring later in the sentence, as no preposition precedes. Hint: Watch for transitive verb.

*prima nocte*: Case? Ablative singular feminine. Construction? Obviously ablative of time when or within which, probably the former on account of *prima*.

*ad castra hostium*: Case? *Castra* may be nominative or accusative plural neuter; but since the word follows *ad*, its interpretation as a nominative becomes immediately impossible. Because of its case ending the form of *hostium* must be that of the genitive plural. The possessive is its only reasonable construction.

*mittit*: Form? Third singular present indicative active of a transitive verb. Use? As the last word in the sentence has been reached, it must be the main verb; and as *Caesar* is the only nominative *Caesar* must be the subject. All the parts now fit together perfectly, and suspense is ended.

"At the beginning each step is taken consciously, to insure recognition of all the possibilities of form, meaning, and construction; but if sufficient drill is given these processes will become automatic."

It is the teacher's duty to make *Caesar* interesting. He should present collateral matters to the class in an interesting way. It will be of help to have the class work very slowly at first, and largely under the supervision of the teacher. This may keep out undesirable "aids" such as are frequently discovered in use by Latin pupils. The teacher should be sure that everything is translated clearly so that all may have a true conception of the subject matter. Encourage the student to display his historical knowledge in the *Caesar* class.

When the study of *Cicero* is taken up the teacher must be sure that the pupils have a clear understanding of the governmental machinery of the Roman State. He must also give them some information on the political and social conditions of the time. Stereopticon lectures on Rome would add to the interest.



In beginning the study of Virgil it is important that the teacher present in an interesting manner "a summary of the dramatic complications and bloody crises which culminated in the empire; a survey of the Augustan Age; a concise account of Virgil's life and literary activity, dwelling on his attractive personality; a definition of the term Epic, comparing and contrasting the Aeneid with other epics; an outline of the story of Troy."\*

Oral practice in metrical reading is all-important, and it will be useful to require the written analysis of some lines.

### B. Vocabulary

Much attention should be given to grouping of words that are related, to the mastery of root meanings, to principles of word formation, and to English derivatives. The meaning of new Latin words may be learned through associating them with English derivatives or with related Latin words. However, there must be formal drill on word lists in the first year, and this may well be continued in Caesar and Cicero classes. To arouse interest and stimulate the enthusiasm of the pupil contests may be held or "wars" may be fought. Divide the class into two sections with due regard to an equal division of ability. If it is to be a war, one army may be the Roman while the other is the Carthaginian. A mis-spelled word counts as a dead man, a mis-pronounced word as a wounded man. Keep the pupils in line even though they may be "dead" or wounded. Put the account of the dead and wounded on the blackboard where all may see it as the battle goes on.

A little nonsense now and then will help to relieve a threatening tedium in the Latin class and may be made of real value. There is a piece of doggerel entitled the "Tale of a 'Possum'" which may be used very effectively "when the class seems stale and listless and nobody appears to have his lesson." It is found in the teacher's manual for Elementary Latin published by Allyn and Bacon. The little poem "Jack and Jill" translated into Latin will help to break the monotony some day. Familiar passages from the Latin Vulgate Bible will help in vocabulary training. If you form a habit of introducing unexpected things into the class the pupils will be eager to come and will enjoy the class far more than the ordinary, humdrum one.

The vocabulary in Caesar and Cicero will be made up of con-

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\* Definition of High School Entrance Units, Univ. of Colo., p. 16.

crete terms and words that are used in a literal sense. But the vocabulary in Virgil will be more enjoyable, because it is figurative and furnishes picturesque meanings, giving an opportunity for play of the imagination. The study of words here may be made one of absorbing interest. It is well to keep a notebook in connection with the vocabulary work in the fourth year.

### C. Syntax

In teaching syntax the same disciplinary objectives should be kept in mind as in teaching reading and vocabulary. English rules of syntax should be reviewed and compared with those in Latin. Examples should furnish the means of grasping grammatical principles rather than printed rules. It is best to have the pupil deduce the rule from the examples. The pupil should form examples to show that he has clearly grasped the principle involved. The teacher must carefully explain all new and unfamiliar grammatical terms.

A thorough review of syntax should be insisted upon in the Caesar class. The structure of complex sentences, word order and word grouping should be carefully studied. The prose writing should be based upon the vocabulary and text of Caesar, and should consist principally of short sentences illustrating principles of syntax systematically presented, with occasional exercise in writing connected narrative. One day a week must be devoted to prose writing during the study of Caesar.

During the study of Cicero there should still be some drill on syntax. One period a week must be devoted to Latin writing. This should deal with vocabulary, idioms, and sentence structure of Cicero. More writing of continuous narrative should be required than during the second year.

Each lesson in Virgil should advance the pupil's knowledge of syntax and increase his facility in translation. The Latin writing, one period a week, should be based on Caesar and Cicero and conducted under the same plan as employed in the third year.

### D. Forms

The increased importance of form in Latin over English should be clearly explained to the pupils at the very beginning. It is of the first importance that the pupil realize a need for learning the declensions and conjugations, and that he should learn them in the first year. This will be memory work, largely, and constant drill



is necessary, with frequent reviews. The skilful teacher will be able to aid the pupil in this memory work in many ways. A good way to stimulate a healthy feeling of rivalry in the class and at the same time insure the learning of forms is to time the individual students on certain groups of forms, namely, the declension of a noun, an adjective, etc. While there will be some who can naturally talk faster than others, the slower one may be encouraged to better his own record so he may not need to feel that his case is hopeless. If a chart containing the records of each individual in the class is kept on the wall the interest will be increased. Pupils will come to the teacher outside of class and request a chance to better their record.

There are many games in Latin which may be used to advantage in stimulating interest and desire to learn forms. The "Game of the Latin Noun" which is very simple will furnish excellent drill on vocabulary and declension forms. There are several verb games, played like "Authors" which will furnish valuable drill on the voice, mood, tense, number and person of verbs, as well as the principal parts of verbs for the more advanced students. These games may be procured from The Latin Game Company of Appleton, Wisconsin.

If the pupils are interested in cross-word puzzles the teacher may take advantage of this interest with profit to the pupil. It is well to furnish the puzzles at first, and later have the pupils make some of their own. Allyn and Bacon publish a valuable little book of cross-word puzzles in Latin and there may be others.

A thorough review of forms should be conducted in the Caesar class and the parts of most of the verbs committed to memory.

Drill on form in the Cicero and Virgil classes is important, but it should be subordinated to the development of an appreciation of the literary and historical content of the text.



**OUTLINE**  
**OF**  
**SPANISH**



**SPANISH****First Year Course**

Texts:

Grammar.

Reader.

Grammar Outline:

1. Alphabet:

The Spanish alphabet can be easily learned and makes the class more interesting. Do not spend much time on it, however:

2. Pronunciation:

Vowel sounds.

Consonant sounds.

Double letters.

Diphthongs.

Triphthongs.

Accentuation.

Syllabification.

Explain and illustrate rules of pronunciation.

Pronounce new vocabularies, having the students repeat each word after it is pronounced.

Drill in pronunciation:

Pupils pronounce new lists of words.

Pupils mark accents on new words.

Pupils divide words into syllables.

Pupils recognize diphthongs and triphthongs.

3. Vocabulary:

Classroom expressions should be given and used from the beginning.

Drill thoroughly on each new vocabulary:

Word drill.

Sentence drill.

Translation of sentences from Spanish to English.

Translation of sentences from English to Spanish.

Teacher reads sentences based on lesson, having pupils translate.

Teacher reads sentences from other grammars based on same vocabulary, having pupils translate.

## Questions :

Questions based on lesson for students to answer in Spanish.

Questions based on matters of daily interest.

## Contests :

Oral contest where class is divided into two groups.

Each side forms a line and words are given in English to be pronounced or spelled in Spanish. Anyone failing to pronounce or spell his word correctly must take his seat. The side having the largest number at the end is the winner. Individual contest seeing who can write the most words from one long word without using any letter more times than is found in the word.

Individual contest seeing who can name the most out of a certain number of given objects.

## Word Groups :

Relate families of words such as *acto*, *actor*, *actriz*.

Keep groups of synonyms and antonyms in notebook.

## Reviews :

Repeat common words often in conversational drill.

## Idiomatic Expressions :

Drill throughout the year on the following :

Idioms with *tener*.

Idioms with *hacer*.

Idioms with *haber*.

Expressions of age.

Expressions of time.

Expressions for please.

Expressions of leavetaking.

Expressions of greeting.

Expressions of pardon.

¿Como se llama usted ?

Me llamo.

En casa.

¿Verdad ?

No hay de que.

En vez de.

Acaba de.

Volver a.



Una vez.  
Con mucho gusto.  
Es hora de.  
Dar un paseo.  
Montar a caballo.  
No más que.  
Otra vez.  
Me cae bien.  
Ya lo creo.

#### 4. Parts of the Sentence.

##### Article.

###### Definite:

Uses and omissions.

Contracted forms with prepositions "a" and "de."

Neuter article "lo."

###### Indefinite:

Uses and omissions.

##### Noun:

###### Kinds:

Common.

Proper.

Augmentative.

Diminutive.

Derivative.

###### Number:

Singular.

Plural.

Use of masculine plural for both genders.

###### Gender:

Masculine.

Feminine.

Nouns with masculine and feminine forms.

##### Adjective:

###### Kinds:

Determining.

Demonstrative.

Possessive.

Relative.

Interrogative.

Indefinite.

Numeral.

Rules:

Agreement.

Inflection.

Position.

Apocopation.

Comparison.

Use for nouns.

Adjectives of nationality.

Pronoun:

Subject:

Omission.

Use of tu and usted.

Possessive.

Relative.

Interrogative.

Object.

Direct.

Indirect.

After prepositions.

Redundant construction with nouns.

Position.

Reflexive.

Reciprocal.

Negative.

Indefinite.

Special drill is needed on object pronouns in conversation and written sentences containing them.

Verb:

Explain the three conjugations.

Kind of verbs:

Regular:

The present, imperfect, preterite, future, conditional, present perfect and past perfect tenses of the indicative mood and the present and imperfect tenses of the subjunctive mood should be thoroughly mastered. The other perfect tenses of both moods should be learned but do not need to be so emphasized.

## Irregular :

The common verbs dar, decir, estar, haber, hacer, ir, poder, poner, querer, ser, tener, venir and ver should be learned in all important tenses named.

## Auxiliary :

Learn haber in all tenses.

Use of deber.

## Radical changing :

Explain the three classes.

Conjugation drill stressing present and absolute tenses.

Drill in recognizing infinitives from a given person and number containing the radical change.

## Reflexive :

Reciprocal.

Inceptive.

Orthographical changing.

## Principal parts :

Infinitive stem.

Infinitive.

Uses.

Present participle.

Formation.

Uses.

Past participle.

Formation.

Uses.

Note especially use for compound tense.

Preterite stem.

## Voice :

Active.

Passive.

## Mood :

Indicative.

Tenses.

Present.

Imperfect.

Preterite.

Sentence drill showing difference between imperfect and preterite tenses.

Frequently explain use of these tenses when found in reading.

Future.

Use for probability or conjecture in present time.

Conditional.

Use for probability or conjecture in past time.

Present Perfect.

Past Perfect.

Preterite Perfect.

Future Perfect.

Conditional Perfect.

Progressive tenses.

Subjunctive.

Tenses.

Present.

Imperfect (both forms).

Present Perfect.

Past Perfect.

Uses.

Sequence of tenses.

Conditional sentences used with subjunctive.

Imperative.

Confusing Verbs:

Ser and Estar.

Frequently state reason for use.

Grade use carefully in written work.

Haber and Tener.

Gustar.

Use with dative case.

Other verb irregularities are uncommon and need not be given until found in reading.

Methods for learning verbs:

Oral and written conjugation drill throughout year.

Tense drill.

Word drill.

Conjugation of verbs found in reading, using tense in which they are written.

Transposition of selections to different tense, person and number.

Sentences containing blanks to fill in correct verb form. This is especially valuable in learning subjunctive mood and sequence of tenses.

Speed contests:

Divide class into two groups and see which group can conjugate a verb in all tenses the quickest and most accurate.

Adverb:

Formation.

Position.

Comparison.

Negation.

Conjunction.

Preposition.

Use before infinitives.

Prepositions "a," "en," "de."

Distinction between "por" and "para."

Prepositional phrases.

Interjections and Exclamations.

#### 5. Sentence Structure:

Punctuation.

Capitalization.

Interrogation.

Exclamations.

Quotations.

Negation.

Position.

Double negation.

Methods of learning.

Conversational drill.

Memory work.

Written answers to questions.

Translations.

English to Spanish.

Spanish to English.

Reading Outline:

A Reader, preferably of short stories, should be used along with the grammar throughout the year.

Method for reading.

Spanish reading.

Lesson translation into clear idiomatic English.

Sight translation.

Paragraph translation for content.

Telling lesson story in own words.

This may be done by several students, each one continuing with the story where the one before finished.

Questions based on lesson.

Review translations of day before.

General suggestions for class work:

Conversation:

Based on lesson studied.

Based on daily occurrences.

Based on special days or months.

Classroom expressions.

Notebook:

Written sentences on each lesson.

Guard against pupils' making same mistakes.

Questions answered on lessons.

Questions made by pupils.

Themes.

Easy subjects.

Use of dictionaries encouraged.

Supplementary texts:

Reading of new material for translation.

Spanish dictation.

Grade for distinguishing and spelling words from pronunciation.

Story telling:

Simple stories that the students already know will bear new interest in Spanish. These may be told by the teacher or a pupils at different times, for pupils to get substance without literal translation.

Reports:

Character and life of Spanish American people.

Games:

There are some games that may be used in class to stimulate interest.



### Numeral games—Silencio :

The pupils of the class should count rapidly and distinctly. If the number can be divided by seven or contains the number seven, the pupil is to say Silencio. If the pupil does not say Silencio when he should, he is out of the game. The counting is continued until all the pupils but one, are out of the game and this one wins.

### El Objet Desconocido :

One member of the class will leave the room till the class agrees on some object, which he must try to guess by asking only such questions as can be answered by "si" or "no." To illustrate; he begins to locate the object, saying: *¿Esta lejos de mi? ¿Esta delante de mi?* Each one in the class is asked a question and answers with "si" or "no," with a complete sentence as: *Si, está lejos de usted.* The last one questioned is the next guesser.

### ¿Quien Es?

The object of the game is to guess the name of a famous man or woman. One pupil selects a name and the other pupils try to guess it by means of "yes" and "no" questions. The one who guesses it may be the next one to choose the name.

### Proverb games :

Send one member from the room; the remaining ones choose a Spanish proverb; assign each of the group a word from this. Recall the exile, who is to ask each person his word, whereupon all whisper loudly their own respective word. The guesser tries to listen to but one at a time and thus get the proverb put together. He who gave it away will be the next to guess.

Divide pupils into two groups. One pupil gives half of proverb and the pupil opposite must complete it or he is eliminated.

Only one word may be given of the proverb.

The English may be given for the opposite side to give the Spanish.

Riddles may be used in these games instead of proverbs.

### Geographic game :

One pupil selects the name of a country. The other pupils try to guess it by means of questions that may be an-

swered by "si" or "no." The one who guesses it may be the next to choose the name.

#### Crossword puzzles:

These may be made by the pupils and a few of the best ones given the class to solve.

#### Plays:

A few short plays given during the year not only inspire interest, but aid in correct speech. The memorizing of plays fixes the idioms and commonplace expressions in the minds of the pupils.

#### Learn short Poems:

Treinta días trae noviembre  
Con abril, junio y septiembre  
De veinte y ocho sólo hay uno  
Los demás de treinta y uno.

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Las ideas generosas son semillas,  
Son frutos las benéficas acciones,  
Los corazones buenos son jardines  
Y las palabras dulces son las flores.

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#### Por Falta De Un Clavo

Por falta de un clavo se perdió una herradura,  
Por falta de una herradura se perdió un caballo,  
Por falta de un caballo se perdió un jinete,  
Por falta de un jinete se perdió una batalla,  
Y todo por falta de un clavo de herradura.

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#### La Madre

Millares hay de estrellas en el cielo,  
Millares, en el mar, de lindas perlas,  
Millares hay de pájaros hermosos,  
Millares hay de piedras primorosas,  
Millares hay de bellísimas flores,  
Millares de pintadas mariposas,  
Y millares de perlas de rocío  
Pero madre en el mundo hay una sola.

**SPANISH****Second Year Course****1. Grammar:**

Review grammar for four weeks with a more detailed study of exceptions to general rules.

Letter writing:

Kinds of letters.

Familiar.

Informal.

Formal.

Commercial.

Letter form.

Heading.

Forms of address.

Complimentary beginning.

Complimentary conclusion.

Commercial forms:

Bill or Invoice.

Sales Account.

Bank Check.

Bank Draft.

Weights and Measures.

**2. Class Reading:**

Read at least four Spanish novels by different authors.

Methods.

Spanish reading.

Translation to clear idiomatic English.

Spanish questions and answers on lesson.

Conversation on matters of daily interest based on vocabulary from the novel.

Lesson story reviewed in Spanish.

Grammar constructions.

Attention should be paid to grammar constructions learned the first year.

Conjugate verbs found in reading lesson.

Sight translation.

**3. Notebook:**

Answers to questions on lessons.

Questions made on lessons.

Translation of English sentences to Spanish.

Themes on subjects relating to novel being read.

Themes on subjects of pupil's choice.

Themes on subjects given by the teacher.

There should be at least one theme every two weeks.

Plays:

One one-act play should be written each semester. The best ones may be learned and presented by the pupils.

#### 4. Outside Texts:

One short novel or a corresponding number of short stories should be read outside of class and reported on each semester.

Sight Reading:

Short stories may be put on the board for content translation.

Ear Translations:

Anecdotes.

Extracts on Spanish American life.

#### 5. Reports:

Newspaper.

There should be Spanish newspapers for reading and reports.

Reports in English from Spanish paper.

Reports in Spanish.

The class should have read the paper and be able to give content of Spanish report.

English reports on Spanish countries, life, and customs.

#### 6. Memory work:

Poems.

Proverbs.

Riddles.

Anecdotes.

Plays.

Songs.

#### 7. Games.

**OUTLINE**

**OF**

**FRENCH**





## FRENCH

(a) Believing with Algernon Coleman (Univ. Chicago) that "there is a very direct connection between the quality of the instruction given at the secondary level and the number and effectiveness of the students who become sufficiently interested in an elective subject to continue it into the advanced courses."

(b) And being heartily in accord with the decision of Franklin Bobbitt (Univ. Chicago) that of eight possible objectives only two—"ability to read the foreign language, and elimination of provinciality of thought and development of world consciousness" are beyond cavil.

(c) And recognizing with the Modern Language teachers of the city of Los Angeles the aim for "an improved understanding of and sympathetic attitudes toward, the people whose language is mastered; 2, a habit of reading the literature in the foreign tongue as fruitful and lifelong leisure occupation; 3, to assist in laying those grammatical foundations valuable in one's use of the mother-tongue"—the committee herewith submits recommendations for a two-year, a three-year and a four-year course in the study of French in the High Schools of Colorado.

### First Year

**Pronunciation:** Accurate pronunciation, accomplished by simple explanations of physiological apparatus, and *contrast* with nearest English sounds, must be an immediate objective throughout the course. In the *first year*, therefore, a phonetic alphabet, giving a single sign for each sound and occasional reference to some good phonetic chart (victor) and *conscientious, consistent drill* on rhythm, as well as pronunciation should enable the student to discern and distinguish the several differences of sound and of silent letters as well in silent as in supervised study.

**Grammar:** Unconscious development and utilizing of correct grammatical forms must be a definite accomplishment, within the limitations of content, for even the High School Course in French. And as a more conscious appreciation of the mother-tongue syntax evolves from this study too much emphasis can not be placed upon essentials which for the *first year* in the order of their importance are judged to be:

**Verbs:** (1) Recognition and assignment of verbs met in

reading to groups ending in *er, ir, re, (oir)*; Conjugation of regular verbs in Present, Imperfect, Past definite, Future tenses.

(2) Conjugation and employment of auxiliary verbs *être* and *avoir* in simple tenses of the Indicative.

(3) Irregular verbs conjugated in Present, Imperfect, Past definite, Future, for example: *aller, avoir, connaître, croire, dire, écrire, être, faire, lire, mettre, ouvrir, partir, pouvoir, prendre, recevoir, savoir, venir, voir, vouloir; impersonal (il faut) reflexive verbs (s'appeler)*;

(4) Conditional, compound tenses and present Subjunctive as well as command form should be recognized even if no stress is placed on their being memorized or given detailed study.

**Adjectives:** (1) Classification of descriptive adjectives according to regular and irregular inflection of gender and number; comparison; agreement; rules for position.

(2) Classification of limiting adjectives according to: articles, numerals, possessives, demonstratives, interrogatives. Inflection and position.

**Nouns:** Memorizing of gender and corresponding article upon presentation; formation of plurals.

**Pronouns:** (1) Classification of and uses for pronouns according to classes: conjunctive or unstressed; disjunctive or stressed; relative; possessive demonstrative; indefinite.

(2) Drill on simpler forms and practice in selecting from reading and ones grammar text;

**Adverbs:** Position and formation adverbs of description: adverbs of quantity, degree.

**Idiomatic details:** Negation; *il y a; de, du; en, y; a, au; on;* etc.

**Reading:** Should be simple and connected, either from elementary text or from abridged editions of literary productions by native authors. Literal translations should be avoided and English equivalent must be used only to insure and test accuracy.

**Conversation:** Should be progressive, spontaneous and of regular importance in the class period, developing aural activity and inviting topical interest by simple speech forms.

**Composition:** Should be primarily English to French, based on grammar rules and examples and derived from reading material with aim to stress visual activity.

**Method:** Should be modification of direct method with individual manner of attack dependent upon teacher's ability and book content. Natural approach by example and inductive presentation of rule-recommended.

### Second Year

**Grammar:** Definite outline for reviewing work of first year and thorough drill on component parts, especially *verbs* and *pronouns*. Continued presentation of form of syntax as previously studied with same text or new one as bases of rule study and drill-work. Constant pressure should be brought to bear upon uses of forms studied both in reading and conversation examples.

**Verbs:** Used and practised in all tenses of Indicative and added forms drawn from common forms of the Subjunctive. All common irregular verbs in Indicative and ordinary or necessary Subjunctive uses.

**Pronouns:** Drill and practice on forms presented in first year.

**Vocabulary:** Becomes repetitive now as well as fundamental. Synonym study and antonym study on simple basis. Study of derivatives in French and French to English.

**Idioms:** Selection from reading of useful idioms for daily use in written and oral forms with occasional reference to current text on French idioms.

**Reading:** From 150 to 250 pages easy material from abridged 19th century text for class-work and 25 to 75 pages of outside reading, voluntary or recommended, urged for additional interpretation in French.

**Background:** In second year should be initiated historical, political, geographical study of France. The outside reading, from pithy source material, should be done in English and used for frequent class discussion.

**Conversation:** Although continued in simple vein might include topics suggested by reading or research, news items or supplementary topics in French periodicals.

**Composition:** May assume large proportions and be directed to subjects of class discussion or outside reading, brief letters and occasional English to French translations to admit of grammatical drill value.

### Third Year

**Grammar Review:** Based on good reference grammar or selections made from illustrative reading passages.

**Vocabulary:** { Systematically increased in content and used in  
**Idioms:** { oral and written class-work.

**Conversation:** { Co-ordinate with ability of pupils and cor-  
**Composition:** { related with text-book material and outside  
 reading content.

**Dictation:** From familiar to unfamiliar subject-matter, evaluating intonation phonetic values and accurate spelling.

**Reading:** From 250 to 350 pages, varying from advanced 19th century reading to include some La Fontaine's Fables and the differences may admit of free discussions on French Literature and types. Outside reading of from 50 to 100 pages may be recommended or prescribed.

### Fourth Year

Same as three in advance of content and difficulty.

### Bibliography

The Teaching of Modern Foreign Languages and the Training of Teachers.—Karl Breul, Cambridge Univ. Press.

The Teaching of Modern Foreign Languages in School and University.—Atkins and Hutton, Arnold Press.

Methods of Teaching Modern Languages.—Handschins World Book Co.

Americans Should Study Foreign Languages.—U. S. Bulletin 14, Department of Interior.

The Modern Foreign Language Study.—Mod. Lang. Journal Reprint.

What the Modern Language Teacher Must Do.—Univ. Chi-Monograph.

Curriculum-Making in Los Angeles.—Bobbitt, Univ. of Chicago.

**OUTLINE**

**OF**

**BIOLOGY**





## **BIOLOGY**

### **PART I.**

#### **Introduction**

This course is planned (1) to give the pupils a grounding in teachers of Biology in the Senior High Schools of Colorado. It is manifestly impossible to outline a course suited to every locality; the teacher must use her judgment and initiative in adapting the course to the needs of her classes and the community and to the equipment at hand.

#### **Aim**

This course is planned (1) to give the pupils a grounding in the knowledge of living things; (2) to sharpen and quicken his powers of observation; (3) to awaken his interest to the end that he may pursue further in College or University various branches of this subject leading to a more complete understanding of man himself and of the universal laws of Nature which control and direct all life both plant and animal; (4) and, finally, to prepare the pupil to meet college entrance requirements within the State of Colorado.

#### **Credit**

From the viewpoint of college entrance credit Biology is an elective subject; from the viewpoint of its importance influencing almost every phase of human life it should be a subject required for graduation from high school. The course as herein planned is both comprehensive and flexible making it easily adaptable to any of the following subject apportionments compatible with the other subject arrangement in the high school curriculum:

First, a full year devoted to Zoology, or the study of animal life.

Second, a full year devoted to the study of Botany, or the study of plant life.

Third, a full year devoted to the study of Biology, or the study of both plants and animals, physiologically and morphologically.

Fourth, a full year devoted to the study of Biology, or the study of plants and animals with special reference to their relation to Civic Welfare; Hygiene and Sanitation.

The tendency at the present time in the smaller high schools is to allow one year only to the study of Biology. To that end a

textbook is generally selected in which the subject matter is so arranged as to allow approximately one semester to the study of either Botany or Zoology, and the second semester to the study of Zoology or Botany with a certain emphasis placed upon Civic Welfare in each semester. This is undoubtedly the best arrangement when only one year can be devoted to the subject. At least seven forty-five minute periods per week, four of which should be arranged into two ninety minute periods of laboratory work, should be provided for this course. Nine forty-five minute periods, six of which are in three ninety minute periods for laboratory work, would be far better and is advised for those schools in which room and time are not so crowded as to preclude such an arrangement.

### The Laboratory

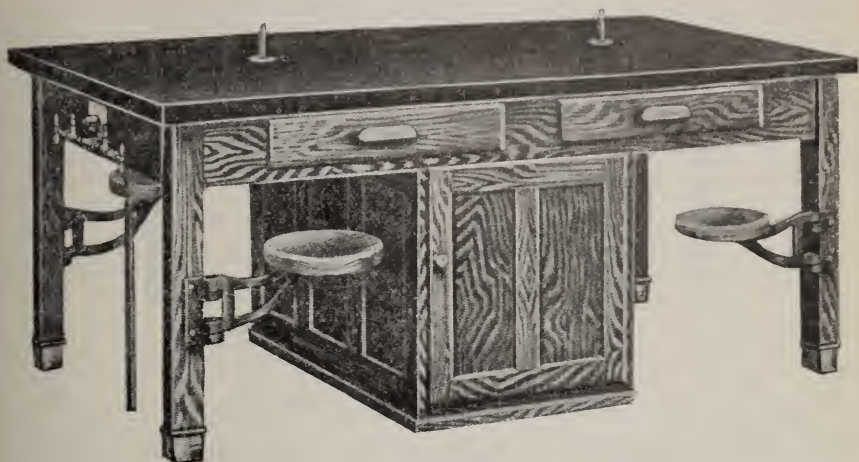
It is presumed that all school authorities are awake to the fact that Biology must be taught by means of the laboratory method. The room, or rooms, set aside for this subject should be selected with great care. The laboratory should be located in the building so as to have a *north* exposure to light. Thus placed, the laboratory will have a plentiful supply of light at every hour of the day without the bother of having to readjust shades continually to secure proper light for use of the microscope. To handle successfully a section of twenty pupils, *two* rooms should be provided when possible: First, the main laboratory. This room should be as commodious as possible, well lighted and well ventilated. It should be no smaller than 20x30 feet, the long axis running east and west. In providing for larger sections than twenty pupils the main room should be correspondingly larger. (Few Biology teachers can handle successfully a larger section than twenty pupils; should the section contain more than this number the teacher should have a trained upper classman as an assistant). The following dimensions are suitable for the main laboratory: 20x30; 25x35; 25x40; 25x50; 25x60; etc. The second of the two rooms given to Biology should be about 20x20 or 20x25. It should contain 20 to 24 seats in tiers to enable the pupils to observe demonstrations easily and clearly.

### Equipment

The teaching of Biology should not be attempted without certain standard equipment. This equipment should include:

### 1. Desks and Stools, or Chairs.

Suitable desks may be secured from any one of a number of supply houses.

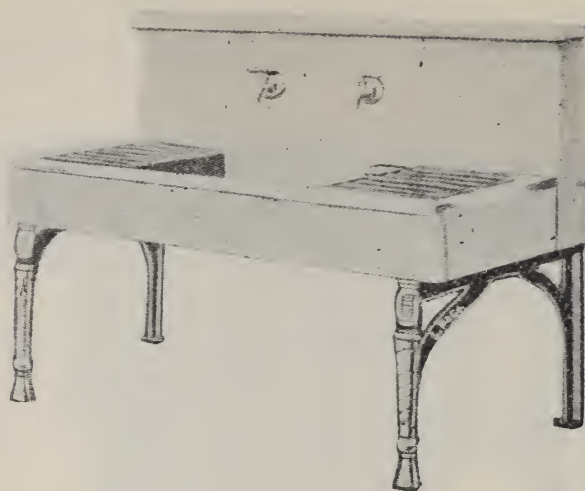


The desk shown in the cut is about right for the average Biology course. This desk is 69 inches long, 42 inches wide and 30 inches high. It accommodates four pupils at one time, provides each with a drawer space for private instruments and materials, and a large door space for instruments and equipment which pupils may use in common. A room 25x35 will accommodate six of these desks without too much crowding. The desk top should have a black, acid-proof finish.

Each pupil should have an ordinary round top stool since chairs are a nuisance in a laboratory. When not in use these stools can be pushed under the desk and are thus out of the way.

### 2. Cabinets and Shelves

The main laboratory should contain several sets of shelves for storage of specimens and other materials for demonstration and class work. These need not be more than a foot deep but should cover all available wall space possible since they will soon be in use. It is a very difficult matter to have *too much* shelf room in a Biological laboratory. Space under the windows can be utilized as shelf room. Only one blackboard is needed—behind the instructor's desk at the end of the room. This blackboard should extend the width of the room.



### 3. Sink and Running Water

This equipment is indispensable in a Biological Laboratory yet sometimes one sees a laboratory without such convenience. The sink should be of moderate size but should be of vitreous china with acid proof connections. It should have both hot and cold water connections.



### 4. Teacher's Desk

The teacher's desk in this room should contain two or three lock drawers and a large door space for personal apparatus. The style shown below is a suitable type.



## 5. Apparatus

There should be at least *one* compound microscope for each four pupils. These microscopes should be equipped with 4mm and 16mm objectives and X5 and X10 eye pieces with double nose piece. They should have the iris diaphragm but do not need an abbe condenser. Oil immersion lenses are not essential for each microscope though the equipment should include at least one 1/12 lens for demonstration purposes.

Each pupil should be provided with a tripod, or other hand, lens magnifying about 10 times.

Each table should be supplied with the following:

- 4 large scalpels.
- 4 small scalpels.
- 4 small sharp point scissors.
- 4 large sharp point scissors.
- 1 bone cutter.
- 8 needle holders with needles.
- 1 paper of pins.
- 20 slides 1"x3".
- 50 cover glasses—round.
- 1 pkg. filter paper.
- 2 alcohol lamps—1 pint capacity.
- 2 ring stands with two rings each.
- 1 Compound Microscope.
- 4 dissecting pans.

The supply case should contain: Chloroform, ether, formalin, iodine, phloroglucin, acetic acid, sulphuric acid, hydrochloric acid, nitric acid, common salt, sugar, ammonia, candle, marble, or coral, etc.

The specimen case should contain preserved representatives of fauna and flora for demonstration purposes. For example, the crayfish is a common type for study in the laboratory. In connection with the study of this animal the instructor should have at hand preserved specimens of the shrimp, barnacle, lobster, fiddler crab, cancer crab, hermit crab, the sow bug, etc.

In plant study the experienced Biologist will rapidly accumulate a supply of preserved plants for comparison and demonstration purposes. This material must have storage room available for the class to reach easily else its value is lost.

There should be plenty of material on hand for class use.

Colorado has a plentiful supply of plants for class work but in the animal kingdom the teacher will have to secure his supplies from a reputable Biological supply house. Specimens properly prepared may be kept indefinitely in formalin. Large battery jars are excellent containers for this material. A separate container should be secured for each kind of specimens with separate containers for those undissected and those partially dissected. An ordinary piece of window glass, placed over the battery jar, the upper edge of which has been smeared with vaseline, makes an excellent cover and because of the vaseline is almost air tight.

*How to Obtain Zoological Material for Class Study*

Amoebae may be found on the under side of decaying leaves at the bottom of irrigating ditches.

Paramoecia may be secured from a hay infusion. Simply place a small wad of dry grass or hay in a half gallon of water. Let stand for a few days. It will be found to contain many forms of Protozoa especially Paramoecia.

Vorticella in the hay infusion.

Sponges-Sycon and Grantia must be secured from a supply house.

Hydra, must be secured from a supply house.

Larvae of the fluke may be secured from body of pond snail; Starfish, Brittle Stars, Sea Urchins, Sand Dollars, Sea Anemones, Coral Polyps, Crayfish, Lobsters, Crabs, large Earthworms, Neries, large Tapeworms, Clams, Frogs, Fish, etc., must be secured from a supply house. Hydra shipped from Lincoln, Nebraska, to Colorado's altitude live but three or four days, hence must be used at once. Much will depend upon the ingenuity, adaptability and resourcefulness of the teacher in selecting and securing material for class work. No Laboratory Manual or Course of Study can possibly include all details.



## PART II.

**The Course in Detail**

Since school begins in September, when flowering plants are comparatively scarce excepting the Composite family, and closes in May before insects make their appearance in many regions of Colorado, this course begins with the Zoological phase of Biology. It is planned so the teacher may take up each form as a separate unit. Optional forms and additional studies are provided sufficient for a full year's work in Zoology if such be deemed advisable and desirable.

**I. Zoology:**

Definition: A study of animal life.

Scope, or range of subject:

Divisions:

**A. Morphological:**

Morphology, or study of form and structure.

Taxonomy, or classification.

Paleozoology, or study of ancient animal life.

Pathology, or study of diseases of animals.

Cytology, or study of cells.

Histology, or study of tissues.

Embryology, or study of undeveloped organisms.

Anatomy, or study of structure; the science of dissection.

**B. Physiological:**

Physiology, or study of life processes.

Genetics, or study of origins.

Neurology, or study of nervous systems.

Ecology, or study of relationships between organisms and their environments.

Experimental Zoology, or study of animals experimentally.

**II. The Organic and the Inorganic:**

1. All things around about are either organic or inorganic.
2. All living (organic) things have certain like points in that they possess the power of:
  - Growth from within.
  - Repair.
  - Excretion.

Reproduction.

Assimilation.

Digestion.

Response to stimuli.

3. Inorganic things have none of these characteristics.

4. The chief elements composing, or influencing, animal forms:

**Oxygen:**

Properties,

Where found in Nature,

How prepared in the Laboratory,

Test for,

Uses.

**Nitrogen:**

Properties,

Where found in Nature,

How prepared in the Laboratory,

Proportion of Air,

Uses.

**Carbon:**

Properties,

Where found in Nature,

Uses.

**Hydrogen:**

Properties,

Occurrence in Nature,

How prepared in the Laboratory,

Uses.

**Sulphur, Phosphorus, Iron, Sodium, Potassium, and Calcium:**

Properties of each,

Occurrence in Nature,

Uses of each.

5. The chief inorganic and organic compounds influencing animals:

**Inorganic:**

Carbon Dioxide:

Composition,

Properties,

Where found in Nature,  
Preparation in Laboratory,  
Uses.

Water :

Composition,  
Uses.

Mineral compounds, several in number—secure description, properties, composition from a standard text on inorganic chemistry.

**Organic Compounds:** Three great classes, Proteids, Carbohydrates and Fats.

**Proteids:**

Composition,  
Test for,  
Uses.

**Carbohydrates:**

**Sugar:**

Kinds of,  
Test for,  
Uses.

**Starch:**

Composition,  
Test for,  
Uses.

**Cellulose:**

Composition,  
Test for,  
Uses.

**Fats:**

Where found,  
Test for,  
Uses.

### **The Laboratory Study of Types**

(Note: Types marked thus (\*) are to be studied as required for minimum essentials).

After having studied those elements and compounds composing and influencing an animal, the beginner should take up the study of an animal itself. The laboratory work should include

the examination of the live animal where possible. Careful examination should be made of the external form and appearance of the animal. A form should be chosen which is easily secured alive, is easy to handle and observe in the laboratory and, which presents no very complicated processes in the dissection thereof. For this reason the common yellow legged locust ("grasshopper") has been chosen as a type for the beginner.

### **The Grasshopper\***

Study the live animal in a vivarium or under a glass dish. Note eating and breathing movements. Note action of mouth-parts.

1. Examine preserved specimen. Note:

a. Length.

b. Number of body divisions:

Head.

Thorax.

Abdomen.

c. Study head to locate:

Compound eyes.

Simple eyes (ocelli).

Antennae.

Mouth parts:

Labrum (upper lip).

Mandibles (black jaws).

Maxillary Palps.

Labial Palps.

Hypopharynx (tongue).

d. Shape of head.

e. Study Thorax and locate:

Connection between head and thorax.

Number of pairs of wings. Texture of wings.

Number of pairs of legs.

Number of legs to each segment.

Number of parts to each leg:

Coxa.

Trochanter.

Femur.

Tibia.

Tarsus—number of segments.

Difference in size of legs.

Reasons for such difference.

Number of segments in thorax.

Parts of each segment:

    Tergum (back).

    Pleurum (side); Pleura (sides).

    Sternum (under side).

Difference between first and second segments.

f. Study abdomen to locate:

    Number of segments.

    Connection of one segment with another.

    Spiracles, function of.

    Female external reproductive organs, or

    Male external reproductive organs.

Difference in number of segments in male and female.

Each segment but first has the following parts:

    Tergite.

    Pleurite (2).

    Sternite.

Locate ear. Describe.

g. Dissect specimen to locate the following organs:

    Pharynx.

    Oesophagus.

    Stomach—Intestine.

    Tracheae. Relation to spiracles.

    Salivary glands.

    Malphigian tubules.

    Fat bodies.

    Ovaries and oviducts, or

    Testes and Vasa Deferentia.

    Arrangement of muscles.

    Blood vessels and heart.

    Brain.

    Nerve cord, ganglia, and nerves.

h. Drawings:

    1. Face of locust X 5 (Five times natural size).

    2. Section of Compound eye, under low power of the compound microscope, to show shape and arrangement of facets.

3. Left jumping leg X 3, to locate all parts.
  4. Opened animal to show parts in situ, X 3.
  5. Remove alimentary canal and draw nervous system to show relation of ganglia to segments, X 3.
  6. Section of trachea under low power of compound microscope to show construction and branching.
2. Additional study and investigation of the locust ("grass-hopper"):
- a. Adaptation to its environment:  
Protective Coloration.  
Protective mimicry.
  - b. Life cycle. Metamorphosis.
  - c. Feeding habits.
  - d. Natural habitat.
  - e. Migratory habits, destructiveness, and methods of destroying swarms of locusts.
  - f. Egg laying habits.
  - g. **Optional:**
    1. Origin of wings.
    2. Origin of large jumping leg.
    3. Microscopic examination of nerve cord.
    4. Microscopic examination of sperm cells.
    5. Microscopic examination of blood cells.
    6. Natural selection as applied to the locust.
    7. Ancestry of the locust.
    8. Used as food. Where?

### Additional Studies In Insects

The locust has been used as a type of study of Insecta. Using the locust outline with adaptations the pupil should now examine externally and internally *two* of the following forms if one semester only is devoted to Zoology, *four* if a whole year is given to the subject: a beetle, a butterfly, honey bee, an ant, a fly, and a mosquito.

The study should include a comparison of organs having the same function in the specimen under observation as in the locust as: the wings, mouth parts, legs, ovipositor, eyes, and antennae. Special attention should be paid to the mouth parts, since insects are divided into two general divisions classified as to biting and sucking mouthparts. Methods for destroying most insects are formulated on the manner in which the mouthparts function.



**Collection and classification of insects:****Collecting:**

Each student should prepare a small collection of insects. This collection should contain representatives, (as directed by the instructor) from each of the eight Linnean orders of insects:

Aptera—Wingless insects—Silver Witches.

Orthoptera—Straight winged insects—Locust.

Hemiptera—Half-winged insects—Squash Bug.

Neuroptera—Nerve winged insects—Ant Lions, Dragon Flies.

Coleoptera—Sheath winged insects—Beetle.

Diptera—Two winged insects—Flies, Mosquitos.

Lepidoptera—Scale winged insects—Butterflies and Moths.

Hymenoptera—Transparent winged insects—Bees, Ants, Wasps.

(Note that in each case of the above orders the name is based upon the wings. Modern entomologists have divided these eight orders into twenty but for elementary work the above arrangement is less bewildering to the beginner). The pupil should have little trouble in identifying his specimens so far as the orders, beyond which classification is not advisable.

**Collecting Materials:**

Net, stretching board, killing can, empty cigar boxes, cork, pins, and moth balls, or powdered naphthalene. These articles are cheap and easily procured. Care must be taken by the instructor in the preparation of the "killing can," since the killing agent—cyanide of potassium, is a deadly poison. The can should be kept away from children and *always* left in the laboratory when not in use. It must be marked: Poison.

**Subjects for Investigation and Report:**

(It is not expected that the instructor will be able to cover all of the following subjects for investigation and report in a course covering one semester. Numbers A, B, C, D, H, N, and T, however, should be covered in the half year's course in Zoology:

**A. Methods for controlling destructive insects:**

1. Insecticides.
  - a. Contact poison-sprays.
  - b. Arsenical poison-sprays.
2. Traps.
3. Cultural methods.

4. Natural Enemies.
5. Exclusion and Restriction.
- B. Beneficial Insects—their life habits and propagation:  
The honey bee, the silkworm, cochineal bug, lady bird, beetle, bumble bee.
- C. Injurious Insects—their life habits.  
The locust, mosquito, fly, beetle, squash bug, ant, butterfly, and cicada.
- D. Metamorphosis in Insects.
- E. The origin and ancestry of insects.
- F. Adaptation to Environment.
- G. Protective mimicry, protective coloration, aggressive mimicry.
- H. Natural Selection.
- I. Relation of certain insects to human welfare:  
The fly, mosquito, flea, bedbug, tsetse fly, as examples of insects which carry diseases affecting man.
- J. The mosquito's role in the life cycle of the malarial organism.
- K. The relation of the mosquito to the building of the Panama Canal.
- L. The relation of the Tsetse-fly to farming in South Africa.
- M. Ways in which man pays for allowing flies and mosquitos to exist.
- N. Methods by which the three great disease carriers, the fly, mosquito, and the flea, may be destroyed.
- O. The sense of sight in insects.
- P. The sense of hearing in insects.
- Q. The sense of smell in insects.
- R. The sense of touch in insects.
- S. Molting essential to the growth of insects.
- T. Cross Pollination of plants by insects.

### **The Crayfish.\***

The second type study is the crayfish. Live specimens are desirable for study of the habits of the animal. But since these would have to be shipped from the Missouri River regions at considerable expense, preserved specimens are more practical. Each pupil in the class should have, at least, one specimen though most classes will need two for each pupil. Wastefulness should

not be encouraged but on the other hand the class should have sufficient material with which to work.

**Observation of external characteristics:**

I. Locate the following:

- a. Cephalothorax-head and thorax.
- b. Abdomen.

1. In cephalothorax locate:

Eyes, antennae, antennules, green gland, mandibles, maxillae, maxillipedes, palps, gill scoop, ear sac, rostrum, carapace.

2. Remove one side of carapace to expose the gill chamber and locate the gills, attachment of gill, number, and kinds.

3. Count legs, noting differences in size from first backward to last one.

4. Compare cephalothorax of crayfish with head and thorax of locust as to shape, size, appendages, shape of appendages, adaptation of appendages, etc.

II. Abdomen:

1. Number and arrangement of segments.

2. Number of pairs of swimmerets.

3. Modification of swimmerets in male.

4. Telson—parts of.

5. Compare Abdomen of Crayfish with that of locust.

III. Drawings:

1. Dorsal view of animal, X 1.

2. A leg with gill attached, X 1.

3. A swimmeret, X 2.

**Examination of Internal Organs:**

1. Remove outer covering and locate:

1. The heart.

2. The ovary and oviducts, or testes and vasa deferentia.

3. The stomach.

4. Oesophagus.

5. Liver.

6. Muscles.

7. Intestine.

2. Draw opened animal to show parts, X 1.

IV. Remove intestine and locate:

1. Nerve cord and ganglia.
2. Nerves running from ganglia.

V. Draw opened animal to show nerve cord, X 1.

VI. Cut open stomach and locate teeth.

The crayfish has two skeletons; an exo-skeleton, and an endo-skeleton.

### **Additional Studies in Crustacea**

Time permitting, use the above outline, somewhat modified, for the study and dissection (when possible) of the sow bug, cyclops, and crab.

Study preserved specimens of the fiddler crab, the cocoanut crab, the hermit crab, the lobster, and barnacle. These animals belong to the Phylum Arthropoda (jointed footed), class Crustacea. They have many striking common characteristics and are related to insects. Practically all Crustacea are scavengers. The majority of genera and species live in or near the sea. Crabs, shrimps, and lobsters are used by man as food.

Additional subjects for investigation:

1. Molting and growth in Crustacea.
2. Probable Ancestry of Crustacea.
3. Land crabs and Agriculture.
4. Habits of the Hermit Crab.
5. Habits of the Fiddler Crab.
6. Evidences of relationship between Crustacea and Insecta.
7. Habits of the Barnacle.
8. Food finding and eating habits of the Crayfish.

**Additional Drawings:**

1. The heart of the Crayfish, X 10.
2. Dorsal aspect of the Sow Bug, X 5.
3. Dorsal aspect of Cyclops, under hand lens.

### **THE MICROSCOPE**

The student has now learned enough laboratory technique as to be able to take up the observation and examination of microscopic animals. But before taking up this work he should become familiar with the parts and workings of the Compound Microscope.

**1. Parts:** Eyepiece, draw tube, body tube, revolving nose piece, objectives, pinon head, micrometer head, arm, stage, spring clip, mirror, base, rack, pillar, inclination joint.

**2. Use:** To enlarge small objects for examination, and to bring out details impossible to observe with the unaided eye.

**3. Care of the Microscope:** The microscope is a nicely adjusted piece of apparatus. Care must be taken to keep eyepieces and objective clean. Every microscope comes from the manufacturers ready for use. A book of instructions comes with the instrument. The instructor should thoroughly master this instruction book before attempting to teach pupils concerning the use of the microscope. Special care must be observed in focusing on an object. The beginner should use, at first, only the *low power*. It is well to begin the study of the use of the Compound Microscope by examining a human hair, a piece of thread, or silk strand. After the student has become proficient in the use of the low power he may be taught to use the *high power*. Potato starch grains treated with iodine solution are good objects for study with high power. The instructor should be sure the pupil *sees* the *starch grains* and not a water bubble before he is allowed to take up farther work with the microscope.

## PROTOZOA

Protozoans are important in that they are the simplest animal forms in existence today. Several common forms are easily available for study.

### The Amoeba (Optional)

**1. Habitat:** In standing water on leaves and at bottom of irrigating ditches.

**2. Appearance:** Nearly colorless, and jelly-like. It is constantly changing its form.

**3. Parts:**

- a. A clearer outer margin.
- b. A granular inner portion.
- c. A nucleus.

**4. Composition:** The jelly-like portion is protoplasm.

**5. Method of Reproduction:** Division, or fission.

**6. Drawings:**

1. Entire Amoeba as seen under the microscope.
2. Entire Amoeba as seen one minute later.



3. Drawings should show:

Nucleus, Vacuoles containing food, or other materials.

**7. Characteristics:**

The Amoeba is a single cell. It has all the vital physiological characteristics of higher multicellular forms such as:

- a. Contractility—or power of motion and locomotion (motion).
- b. Irritability—or response to stimuli (sensation).
- c. Digestion.
- d. Assimilation.
- e. Excretion.
- f. Respiration.
- g. Reproduction.

**The Paramoecium\***

1. **Habitat:** In hay infusion.

2. **Appearance:** Slipper shaped hence called the "Slipper Animalcule." Motion is very rapid as seen through the microscope. Clear and jelly-like but more clearly outline than the Amoeba. Is rarely ever quiet when alive.

**3. Parts:**

- a. Definite interior portion.
- b. A vestibule, or mouth.
- c. Nucleus.
- d. Vacuoles: food, water, etc.
- e. External portion covered with cilia.

4. **Composition:** Contains large amount of protoplasm as does the Amoeba.

5. **Method of Reproduction:** Division, or fission.

6. **Drawings:** a. Entire animals as seen through compound microscope to show all parts. The paramoecium is a single celled animal as is the Amoeba. It exhibits all the physiological characteristics of protoplasm as noted in the Amoeba.

**Vorticella (Optional)**

1. **Habitat:** a. In hay infusion, on sticks and grass in stagnant water.

2. **Appearance:** Bell shaped, with handle of bell down. Attached to long stem. Stem when retracted is coil-spring shaped.



Clear and jelly-like though bounded by definite boundary. Top part fringed with cilia for food getting and locomotion.

### 3. Parts:

- a. Bell shaped body, definite in outline.
- b. Contractile stem.
- c. A definite vestibule, or mouth.
- d. Cilia for food getting and locomotion.
- e. Two nuclei: micronucleus, and macronucleus.
- f. Food, water, and contractile vacuoles: contractile vacuole definitely located.

**4. Composition:** Single celled, containing large amount of protoplasm. Exhibits all the physiological characteristics as noted in *Amoeba Paramoecium*.

**5. Method of Reproduction:** Division, or fission. The process may be noted under the microscope—complete fission being accomplished in ten to twenty minutes.

**6. Drawing:** a. Entire animal, as seen through the compound microscope, to show all parts.

## The Single Cell

The pupil has just studied the simplest forms of animal life—the one-celled animals. Before taking up the many celled animals further, a brief introduction to the cell as such is necessary. The cell is the foundation in tissue building. Morphologically speaking the cell is a globe, or many-sided box, depending upon whether it is free or in contact with other cells.

### 1. Parts:

- a. Generally speaking the animal cell has three distinct parts, which are easily distinguishable through the microscope:
  1. Cell wall.
  2. Cell sap, containing protoplasm.
  3. Nucleus.
- b. The nucleus is the most important portion of the cell since it contains the material from which the chromosomes, or heredity bearers, are formed. The study of mitosis, or nucleus division, is too complicated for an elementary course in Zoology so is not attempted here. Let it suffice to say that growth in animals (and plants) is brought about by cell division. A cell grows till it

reaches a certain size; it then divides into two, each of which grows to the size of the parent cell when division again takes place. The process is continued throughout the life of the organism. In the one-celled organism, just studied, cell division produces by division two daughter cells each to live a separate existence having all the characteristics of the parent; in the multi-celled organisms each cell does not perform all functions, as in the one-celled organism, since there has now come about a "division of labor." Certain cells have become specialized in certain work. There are special organs of locomotion, respiration, digestion, food getting, reproduction, sensation, etc. This specialization will be further discussed under the next great division of the animal kingdom:

### The Metazoa

Under the term Metazoa will come all of the animal kingdom not in the Protozoa, or one-celled animals. The first group of the Metazoa is called Porifera and means "pore bearing." This group or phylum, includes the sponge. (The pupil should bear in mind that the Grasshopper and its relatives and the Crayfish and its relatives mentioned belong to the Metazoa).

### The Grantia Sponge\*

1. **Habitat:** Fresh or salt water?
2. **Appearance:** Shaped like a baseball bat, larger end up; many pores on sides, called "incurrent pores." Mouth at upper end called "osculum."
3. **Drawing:** a. Entire animal, X 3, to show parts mentioned.
4. **Internal Anatomy:**
  - a. Cut open animal length-wise with sharp razor.
  - b. Note:
    1. Internal cavity—called cloaca.
    2. Cloaca's connection with osculum, or mouth.
    3. Radial, or horizontal canals connecting external pores with cloaca. These canals carry water from the incurrent pores to the cloaca and are lined with vibratile cilia, which when in motion cause a current of water to enter the incurrent pore, pass

into the cloaca and out the osculum. This current of water brings food with it and the animal is thus fed.

### 5. Drawing:

- a. Horizontal section of the opened animal to show cloaca, osculum and pores, X 3.

### Commercial Sponge (Optional)

The commercial sponge purchasable in stores differs from the *Grantia* in that it is a colony of simple sponges, and in that it is only the skeleton of the animal.

1. **Habitat:** Fresh or salt water?
2. **Appearance:** Describe.
3. **Elasticity.**
4. **Fibrous structure**—examine fibers under microscope.
5. **Attachment**—Note portion seemingly cut or trimmed.
6. Canals and perforations in sponge.
7. Look down large opening toward base. Note small channels opening into the large openings.
8. In life the commercial sponge is grayish in color and about the consistency of calf liver.
9. The living sponge secures food and oxygen as follows: water carrying food and oxygen enters the smaller openings, or incurrent pores, thence into the incurrent canals and from thence into the cloaca or large sack-like channel and eventually passes out through the large opening, or osculum.

## THE COELENTERATA

### The Fresh Water Hydra\*

The Porifera, or pore-bearing animals, constitute the simplest Metazoa in that they have but two layers, the endoderm and the ectoderm, or the inner and the outer layer. The animals now to be studied are a step higher in the scale of many-celled animals in that they have three layers—the endoderm, the extoderm (as the sponge) and the mesoderm, or the inner, outer, and middle layers, though in the first type to be studied, the *Hydra*, the mesoderm, or middle layer is not very conspicuous. Animals to be found in this group have a digestive system never wholly cut off

from the body cavity. This group, or phylum, is known as the Coelenterata. Hydra, Jelly-fish, sea anemone, coral polyp, sea fans, etc., belong to this phylum.

1. **Habitat:** Fresh water, attached to leaves, etc.
2. **Appearance:** Color, shape, length as compared with width.
3. **Tentacles,** mouth.
4. **Motion** and locomotion.
5. **Food getting** and reproduction.
6. **Buds, ovaries, spermaries.**
7. **Difference** between sexual and asexual reproduction.
8. Regeneration as means of reproduction.
9. Nematocysts—form and function, location.
10. This animal contains both male and female sexual elements. Such an animal is called a hermaphrodite in honor of the personages in Grecian Mythology: Hermes and Aphrodite.

If time permit the study of several forms, some of which have been mentioned, is interesting and helpful. Laboratory shelves should contain specimens of campanularian hydroids, tubularian hydroids, coral polyps, sea anemones, both in the expanded and contracted state, Jelly fish (one rather large) and medusae. There should be dried specimens of Sea Fan, various kinds of coral, etc. The instruction should include a description of the life habits and habitats of the several forms, an explanation of "alternation of generation" as found in some forms in this phylum. Pupils should be encouraged to search diligently for articles on the habits of coral and the relation of the life and habits of the coral polyps to coral islands, atolls, subsidence and elevation of land, etc.

## THE ECHINODERMATA

The next phylum to be studied contains the starfish, sea urchins, sand dollars, crinoids, etc., and is termed Echinodermata, or animals having a covering like a hedgehog. This refers to the spines to be found on certain parts of the animal's anatomy. These spines are especially evident in the sea urchin. These animals were formerly said to belong to the Radiata because they had arms which radiated out from a given center. We now speak of them as being radially symmetrical as distinguished from the vertebrates which are bilaterally symmetrical.

### The Starfish

The pupil will need, at least, one preserved specimen for dissection. There should be at hand several dried specimens representing several species of the Starfish.

1. Habitat—Salt water.
2. Appearance—Describe.
3. Number of rays or arms.
4. Arrangement of rays:
  - a. Anterior ray.
  - b. Bivium.
  - c. Trivium.
5. Location of eyes, number of eyes.
6. Location of Madrepovic plate, Function of.
7. Dorsal, or aboral surface.
8. Ventral, or oral surface.
9. Ambulacral groove. Function.
10. Ambulacral feet, function, how operated.
11. Mouth.
12. Method of food getting.
13. Drawing—Draw aboral surface of the animal, X 1, to show all parts possible.

#### Internal Anatomy: Locate:

1. Stomach, with pouches extending into arms.
2. Liver—five lobed.
3. Oesophagus.
4. Intestine.
5. Reproductive organs.
6. Ring canal, function.
7. Radial canals, function.
8. Ampullae, function of.
9. Stone canal, function of.
10. Nervous system:
  - a. Nerve ring.
  - b. Radial nerves.

**Drawing:** Draw oral aspect of animal, X 1, to show position of mouth, location of ambulacral groove and tube feet.

### The Sea Urchin

The Sea Urchin may be studied for its external characteristics. Two sets of material should be at hand: preserved material showing spines intact; and dried, or preserved, material showing



animal with spines removed. The pupil should note particularly the position of the eyes: in a circle on the aboral surface. Compare with location of eyes in Starfish. Could the rays of the Starfish be bent upward and backward the eyes would appear exactly where they are in the Sea Urchin. Conclusion as to ancestry and relationship. Economic importance of Starfish and Sea Urchin.

## THE MOLLUSCA

In the phylum Mollusca there are to be found many and varied forms, such as the oyster, land snails, sea snails, cuttle fish, octopus, squid, clams, etc. Many forms are of economic importance as the oyster and the clam as food; many large bivalves found in the sea from which buttons and mother of pearl objects are made; and the pearl oyster which produces pearls.

### The Clam\*

The clam is taken as a type for the study of this phylum. The animal is inclosed in a two-valved shell hence is known as a bivalve. (The common snail having but one part or valve to its shell is known as a univalve).

#### A. The Shell: Note:

1. The valves.
2. Ventral margin.
3. Dorsal margin, or hinge margin.
4. Concentric lines of growth.
5. Beak, or umbo.
6. Hinge ligament. Hold the shell with the hinge ligament up and nearer to you than the umbo. Note:
  1. Anterior end.
  2. Posterior end.
  3. Right and left valves according to your right and left.

#### B. Drawing:

1. Make a drawing of the shell as seen from one side, X 1, to name all parts.

#### C. Internal Anatomy:

Preserved material kept for some time in formalin should be washed in clear water and then allowed to remain in clean water over night. This will remove much of the formalin which other-



wise might be irritating to the tender membranes of the nose and eyes.

Before beginning dissection note that the valves of the shell are held apart by a small plug of wood. Note also the white mantle lying against the inner surface of the shell. Run the blade of the scalpel between the mantle and the shell until a large muscle, attached to the shell, is encountered. Cut this muscle. There are two of these muscles which close the shells. Cut this second muscle and the valve may be laid back exposing the animal lying in the other half of the shell.

a. Note the following parts:

1. Mantle. Function, extent, remove.
2. Siphons. How many. Function.
3. Foot.
4. Heart.
5. Stomach.
6. Gills.

b. Study in reference books:

1. Locomotion in clams and other Molluses.
2. Pearl fisheries.
3. How pearls are formed.
4. Probable origin and ancestry of clams.
5. Myths and legends concerning the "devil fish."
6. The "Chambered Nautilus."
7. Oyster Culture.

c. Optional:

Time permitting, additional forms may be studied. Small devil fish may be secured at a low cost from a supply house and are of great interest to pupils. Land snails are easily and cheaply secured and dissection is easy. Much that has been covered concerning the clam may be used for the snail with some necessary modifications which the teacher will note at once. Pond snails are easily kept in an aquarium where their habits may be studied. Their eggs will be very abundant at certain times and are of great interest to pupils. The phylum mollusca is of extreme age. The early Cambrian and Silurian Seas teemed with Mollusk life. There is a never-ending source of pleasure, to that one who has made a study of old life, in finding in the outcrops in Colorado, forms of

Molluscs very similar to those in existence today yet which died uncounted millions of years before man made *his* appearance.

## VERMES

(Taken from Moon's "Biology for Beginners," page 169).

**Representatives:** Earthworm, tapeworm, hairworm, vinegar eel, leech, etc.

### The Earthworm\*

Anterior and posterior (define in notes).

Dorsal and ventral (define in notes).

#### I. External structure. Shape.

- a. Segments, count them.
- b. Girdle—function.
- c. Mouth—call attention to pre-oral lobe, Vent.
- d. Setae, adaptations.
  1. Number.
  2. Location on sides.
  3. Attached to muscles.
- e. Functions of setae:
  1. Locomotion.
  2. Burrowing.
  3. Foodgetting.
- f. Reproductive openings on segments 9, 10, 14 and 15.
- g. Both sexes in individual.

#### Drawings:

1. Draw ventral aspect of anterior portion including ten rings behind the girdle (clitellum), X 3.
2. Draw posterior 10 segments to show flattening of posterior region, X 3.

#### II. Internal structure:

1. Body wall, two muscle layers, use of each, cuticle.
2. Digestive system:
  - a. Mouth—manner of food getting.
  - b. Muscular pharynx, function.
  - c. Crop, stomach, and intestine with special functions.
  - d. Circulatory system:

Dorsal and Ventral vessels.

- e. Function of *any* circulatory system:
  - 1. Transfer food from digestive organs to tissues.
  - 2. Transfer oxygen from lungs to tissues.
  - 3. Transfer waste from tissues to excretive organs.
- 3. Excretory organs:
  - Pair in each segment, well developed.
- 4. Nervous system:
  - a. Simple brain and ventral nerve chain.
  - b. Separate nerve branches.
- 5. Locomotion:
  - Adaptation for:
    - a. Body muscles, two layers, different motions.
    - b. Setae with own muscles.
    - c. Habit of flattening the "tail" region in burrowing.
- 6. Burrowing: adaptations for:
  - a. As above.
  - b. Habit of swallowing earth through which it goes.
  - c. Evidence shown in "castings."
- 7. Food-getting:
  - a. Food:
    - Celery, lettuce, meat, etc.,  
taken from surface below;  
Organic matter in soil.
- 8. Economic Value: Earthworm, loosens and enriches soil, brings up fresh soil, takes down organic matter 10 tons per acre per year.

### Drawings:

- a. Open the animal as directed by the instructor. Note: location and relationship of internal organs.
- b. Draw opened animal, X 3, to show all parts.
- c. Remove intestine and draw nerve cord in natural position, X 3.
- d. Remove one ganglion and examine and draw under low power of the compound microscope.

### The Tapeworm. (Optional)

- 1. External structure:
  - a. Head, body.
  - b. Segmentation.

## 2. Development:

- a. Eggs eaten by pigs or cattle.
- b. Egg develops in intestine of pig or cow.
- c. Young bore into muscles, and go into resting stage.
- d. Meat, not thoroughly cooked, eaten by man.
- e. Development of young tapeworm continues. Causes weakness and anaemia.
- f. Head attaches by hooks, absorbs food, animal grows by segments.
- g. Segments produce many eggs, which are scattered.

**Trichina.** (Optional)

## 1. Development:

- a. Young bore into muscles and form cysts (in animals).
- b. Uncooked flesh eaten and cyst dissolves (in man).
- c. Young again bore into muscles producing disease or death.

**Hookworm.** (Optional)

1. Enters human beings by way of feet, veins, lungs, throat, intestine.
2. Punctures intestines, causing loss of blood and absorbs food.
3. Lowers strength, makes susceptible to other diseases.
4. Loss in labor of \$20,000,000 per year in the United States.

**Parasitism\***

## 1. Results:

- a. To host:
  - Harm or death.
- b. To parasite:
  - Degeneration.
  - Loss of organs.
  - Absolute dependence.
  - Need for vast reproduction.

**THE VERTEBRATES**

Animals so far studied have all belonged to that division of the animal kingdom known as the Invertebrates or backbone-less animals. Invertebrates made their appearance in the seas and on land many millions of years before the coming of the earliest backboned animals, or vertebrates. One of the earliest vertebrates to be found as fossils is that of the fish though not the

same form of fish as we find today. For observation in the laboratory there should be provided for each desk a bowl containing live gold fish. For dissection preserved perch should be provided.

### Live Gold Fish\*

Study and describe:

1. Method of locomotion:
  - a. Which fins are used as propellers.
  - b. Which fins are used as balancers.
  - c. How is the tail fin used.
2. Place a rubber band around the front fins so they cannot be used. Result.
3. Try another pair of fins in the same manner. Result.
4. Note method of breathing. How does the fish breathe?
5. Note method of food taking.
6. Why does the fish not drown in water? Can a fish be drowned?

### The Perch.\* (Preserved in formalin)

#### A. External Anatomy:

1. Shape—Describe.
2. Locate:
  - a. Mouth—teeth if any.
  - b. Nostrils—use of.
  - c. Eyes—Compare with eye of frog and cat.
  - d. Gill covers—use.
  - e. Fins. How many. Use.
  - f. Ears—if any.
3. Lift up gill cover and note gills.  
How many, describe. Function.
4. Note covering of this fish—remove a scale—examine. Draw.
5. How are scales arranged on the fish? Is this a proper arrangement?
6. Remove gill cover so as to expose gills on one side. Draw head; natural size, to show all parts possible.

#### B. Internal Anatomy (Optional):

1. Open animal as directed by the instructor.

## 2. Locate:

- a. Heart.
- b. Liver.
- c. Stomach.
- d. Intestine.
- e. Spleen.
- f. Reproductive organs.
  1. Ovary in female.
  2. Testes in male.
- g. Bladder.
- h. Kidneys.

## 3. Drawing:

Draw the opened animal to show the parts, as many as possible.

**C. Additional Topics for study.** (Optional).

1. Microscopical examination of blood of live gold fish.
2. Microscopical examinations of sperm and ova of live gold fish.
3. Government bulletins or fish hatcheries. Where located, and how managed.
4. Early fish—Fish today most resembling early (Devonian) fishes.
5. Economic importance of fishes.
6. How are fish used by man otherwise than as food.
7. Fish in literature; in religion; in Mythology.
8. Reproduction in fish. Egg-laying habits.
9. Migratory habits.
10. Examples of special adaptations to environment as shown in:
  - a. Fighting fishes.
  - b. Flying fishes.
  - c. Climbing fishes.

### The Frog

For many milleniums after their appearance fishes held sway in the seas of the globe. The gradual elevation of the land above the sea to form inland swamps which in turn became fresh water swamps, the changes in atmospheric conditions, and many other causes with which the scientist is not familiar, a group of vertebrates appeared having power to breathe by means of gills in water during a part of their existence, and by means of lungs on



land during part of their existence. The members of this group are called Amphibia which means "both lives." At one time Amphibia were very numerous as to genera and species and many forms were very large. In fact, the period known as the Carboniferous, or Coal bearing, Age is also known as the "Age of Amphibians" due to the number, diversity, and size of these animals. Today, however, due to many causes but a few representatives of Amphibia are in existence commonest of which are the frog, the toad, and the salamander. The frog is the most familiar and is the type usually studied in this group. If possible each four pupils should have a live frog for study. Live frogs may be purchased from supply houses far distant and kept alive all winter in an ordinary box with proper cover and fed by running tap water. Unless live frogs are plentiful each pupil should be supplied with a preserved specimen for dissection.

### **The Live Frog**

Examine and study:

- a. Method of locomotion.
- b. Motion of throat while breathing.
3. Sitting posture.
- d. Touch the skin of the frog. What is the sensation?
- e. Are the eyes moveable.
- f. Number of eyelids.
- g. Ears. Shape and location.
- h. Difference in color between dorsal and ventral surfaces.
- i. Color of frog. Why mottled?

### **The Preserved Frog**

Examine and study:

#### **A. External Anatomy:**

1. How many body regions.
2. Legs. Difference in size. Functions.
3. Adaptations of feet.
4. Nostrils. Do they open into mouth?
5. Mouth:
  - a. Tongue—how fastened.
  - b. Teeth—how many and where located.
6. Number of toes on fore and hind feet.
7. Can it be discerned from his shape that the frog is a good diver?

## B. Internal Anatomy:

Dissect as directed. Note:

1. Thoracic and abdominal muscles.
2. Heart. Name parts and branches of arteries.
3. Lungs.
4. Liver, stomach, intestines, bladder.
5. Reproductive organs:
  - a. Ovaries, oviducts, and eggs (?) in female.
  - b. Testes and vasa deferentia in male.
6. Kidneys, spleen, gall bladder.
7. Dorsal aorta, Hepatic and portal veins.
8. Nervous system.

## C. Drawings:

1. With toothpick prop mouth of frog open and draw to show location of teeth, etc.
2. Draw left fore and hind leg for comparison.
3. Draw opened specimen, X 1, to show all parts possible with their due relationship.

## D. Optional:

1. From pictures and description in reference works on Zoology and Anatomy compare the heart and circulatory systems of each of the following animals with those of man: the fish, the frog, the bird, and the cat.
2. Treat the nervous system in like manner.
3. Treat the digestive system in a like manner.
4. Stretch web between toes of foot of frog on stage of microscope and focus microscope to show circulation of blood from arteries through capillaries to the veins on return journey to the heart. A very interesting and simple demonstration of blood circulation.

### The Bird

The fish and the frog just studied are examples of cold blooded vertebrates, that is, they have the power to change the temperature of their blood to correspond nearly to the temperature of their surroundings without becoming chilled to a degree to cause death. Frogs seek the mud in the bottoms of streams and ponds with the approach of winter. They fall into a comatose condition seemingly lifeless and remain in this state till the warm

spring days begin. Reptiles enjoy a similar privilege. Thus we speak of fish, frogs, and reptiles as being coldblooded to distinguish them from the warm blooded animals: birds, and mammals including man, which cannot stand a fall in temperature without fatal results.

The pupil should make a study of the bird from the standpoint of natural history. If stuffed specimens are not at hand Audobon societies will furnish charts of birds in color for study. The pupil should study from observation and books:

1. Color of male and female.
2. Males are usually more highly colored than females. Why?
3. Which is the greater songster, the male or the female?
4. Shape of beaks and feet.
5. How do beaks and feet show life habits as to offense and food-getting.
6. Nesting habits of birds.
7. Migratory habits of birds.
  - a. Winter birds—appearance and disappearance.
  - b. Summer birds—appearance and disappearance.
8. Economic value of birds.
9. Food of birds.
10. Necessity to protect bird life. Why?
11. Compare covering of bird with that of a fish, frog, and cat, and also show how each is adapted to its particular environment as shown by its covering.

### **The Mammalia**

From the standpoint of size, usefulness and variation the Mammalia represent the most important branch of the vertebrate kingdom. Members of this group range in size from the whale and elephant to the small mice and bats. They occupy the frozen regions of the North and the tropical forests of the South. They are to be found in all the lands of the globe. Mammals differ from all other animals in that they have hair as a whole or partial covering, bring forth their young alive, and suckle their young. The term "Mammalia" comes from the Latin word "mamma" meaning breast. Mammals fly in the air—bats; swim in the seas—whale; and roam over the land. They are all warm blooded animals.

The pupil should study mammals from the standpoint of natural history. The cat and the dog are good examples. The pupil should compare the cat and the dog as to:

1. Anatomical differences and likenesses, shape of body, claws, teeth, and eyes.
2. Foodgetting, sleeping and waking habits.
3. Docility. Teachableness, faithfulness.
4. Shape of body, claws, teeth, eyes.
5. Natural habitats.
6. **Optional:**
  - The dog in literature, war, and peace.
  - The relatives of the dog.
  - The near relatives of the cat.

### **Human Biology**

#### **A. Man's place in Nature:**

1. The Primates.
2. *Homo sapiens*.
3. How man is like and is unlike other primates.

#### **B. Physiology and Civic Welfare:**

A good text on Human Physiology and Civic Welfare should here be introduced and studied to bring out the need for man to care for his own body and to assume civic responsibility for the general welfare. The nature of germs and germ diseases should be stressed together with that of the necessity for destroying germ carriers. It is assumed that all high school pupils have had training in human physiology hence the subject is not specially outlined here.

## PART III

**BOTANY****The course in detail.**

Since school begins in September, when flowering plants are comparatively few in Colorado excepting the Composite family, it is advisable for work in Botany to begin in January when only one semester is given to this phase of Biology. When a whole year is given to the subject the instructor can select from the units of this course work suitable to the season in question.

**I. Botany:**

Definition: A study of plant life.

Scope, or range of subject:

Divisions:

**A. Morphological:**

Morphology, or study of form and structure.

Taxonomy, or classification.

Paleobotany, or study of ancient plant life.

Cytology, or study of plant cells.

Histology, or study of plant tissues.

Embryology, or study of undeveloped organisms.

Anatomy, or study of structure; the science of dissection.

**B. Physiological:**

Physiology, or study of plant life processes.

Genetics, or study of plant origins.

Ecology, or study of relationships between plants and their environment.

Experimental Botany, or study of plants experimentally.

**II. The Organic and the Inorganic: See page 101.****The Laboratory Study of Plant Structures****The Seed and the Seedling.**

The seed is the resting stage in the plant. It is the function of the seed to tide over the plant life during unfavorable conditions such as drought, winter, etc. The seed is a miniature plant in a state of arrested animation. It will awake to active life under proper conditions. As will be shown later proper conditions for seed awakening are: first, a proper amount of moisture; second,



a proper amount of air; and, third, a proper amount of heat. During the winter months seeds can be germinated and grown in the laboratory very successfully. For all practical purposes but three kinds of seed need to be studied: lima bean, radish, and corn.

### **How to germinate seeds in the Laboratory:**

#### **Materials:**

Empty cigar boxes.

Damp paper, soil.

Seed of various kinds.

Place a layer or two of damp paper in the cigar box, place seed on paper and cover tightly and completely with other layers of damp paper. Also plant some in boxes of soil. Water daily—including *Saturday* and *Sunday*. In the meantime, while waiting for the seed to begin to sprout, work may be carried on in the study of the germinating lima bean. The bean after being soaked overnight has more than doubled in size so that its parts may be easily studied:

### **External Anatomy:** Note shape:

1. Locate:
  - a. Testa, or covering.
  - b. Hilum.
  - c. Micropyle.
2. Split testa open. Note:
  - a. Two halves to seed, called cotyledons.
  - b. Radical, or young root.
  - c. Hypocotyl arch.
  - d. Young leaves—note folding.
3. Draw opened seed to show all parts above mentioned.
4. Function of Cotyledons—food storage.
5. Function of Hypocotyl arch—push up through earth.
6. Function of radical—becomes root.
7. Function of Testa—to protect young embryo.
8. Function of micropyle to allow water to enter, and to allow radical to escape.

### **Experiments with germinating seeds:**

I. To prove germinating seeds need a proper amount of air to germinate successfully:

#### **a. Materials:**

1. Two bottles with corks.



2. Soaked lima beans.
3. Damp paper or sand in bottles.

b. **Procedure:**

1. Place soaked beans in each bottle.
2. Cork one bottle tightly—leave other uncorked.
3. Allow both bottles to stand for several days—two weeks.
4. Note results.

c. **Conclusion**—Write out conclusion.

II. To prove that germinating seeds need a proper amount of moisture to germinate successfully.

a. **Materials:**

1. Three bottles with or without stoppers.
2. Dry lima beans.
3. Moist blotting paper, or damp sand.

b. **Procedure:**

1. Place an equal number of beans in each bottle.
2. Cover beans in one bottle with damp sand; leave beans without damp sand in one bottle, fill third bottle with water.
3. Allow bottles to stand for 10 days or two weeks.
4. Note results.

c. **Conclusion:**

III. To prove that germinating seeds need a proper temperature to germinate successfully:

a. **Materials:**

1. Three bottles containing damp sand and lima beans.

b. **Procedure:**

1. Place one bottle at room temperature; one in a refrigerator containing ice; one in an oven heated at about 100 degrees Fahr.
2. Let stand for a 10-day period.
3. Note results.

c. **Conclusion.**

IV. To prove that water enters the seed at the micropyle to produce germination:

a. **Materials:**

1. Lima Beans.

2. Sealing wax.
3. Beaker of water.
4. Matches.

b. **Procedure:**

1. Examine beans to see that the testa is not cracked or broken.
2. Seal micropyle of six beans with melted sealing wax.
3. Select six others but do not seal.
4. Place sealed and unsealed beans in beaker of water. Observe after 48 hours.

c. **Conclusion:**

V. To prove that air dry seeds contain moisture:

a. **Materials:**

1. Test tube.
2. Radish seed.
3. Alcohol lamp and flame.

b. **Procedure:**

1. Place a spoonful of seed in the test tube.
2. Hold test tube over flame.
3. Observe any change taking place.

c. **Conclusion:**

High School pupils delight in *doing* things hence the performance of the foregoing simple experiments serve to secure the interest of the pupil and to lay the foundation for future experimentation. Attention should now be turned to the seed planted in boxes of damp paper and soil.

1. Note place of appearance of radical, or rootlet.
2. Note splitting of testa and enlargement of embryo.
3. Draw opened seed when radical is one inch long, X 2.
4. Note appearance of secondary roots on radical.
5. Note from day to day growth in the bean seedling until the young plant has been growing for ten days or so.
6. Make drawings, natural size, of four stages in addition to the last drawing. Study carefully any changes you can find.
7. Note, at least, two things: first, the increase in size of the young plant, growing on damp paper, and, second, the decreased and shriveled appearance of the two colytdeons. How do you account for these phenomena.

8. Plant Radish and Corn seed as Lima Beans were planted. Examine growth and sketch progress as in the Bean plant. Differences. The Bean and the Radish are examples of a group of plants known as Dicotyledons, while the corn belongs to the group known as Monocotyledons.

### The Root

1. Origin of root—from radical.
2. External anatomy of the root:
  - a. Primary root.
  - b. Secondary, tertiary, etc., roots.
  - c. Root hairs.
3. Roots are leafless.
4. Classified as to form:

Tap roots, fibrous roots, fleshy roots.
5. Classified as to position of growth:

Soil roots, aerial roots, adventitious roots, water roots.
6. Function of roots:
  - a. To anchor plant to soil.
  - b. To secure food in solution from the soil.
  - c. To store food in some species as sweet potato, radish, turnip, etc.
  - d. Respiration.
7. Growing point of root—near the tip.
8. Absorbing portion of a root—near the tip.
9. Location of root hairs—near the tip.
10. Function of root hairs—to increase the absorbing portion of a root.
11. Internal anatomy of the root:
  - a. Epidermis—function.
  - b. Corky portion—function.
  - c. Stele or central cylinder—function.
  - d. Vessels in central cylinder—function.
  - e. Root cap—function.
12. Drawings:
  - a. Draw cross section of typical root to show all parts—low power.
  - b. Draw longitudinal section of a typical root to show all parts—low power.

13. Roots receive water from soil by means of Osmosis:
- a. Meaning of term.
  - b. Necessary conditions are:
    1. Two solutions, one denser than the other.
    2. A semi-permeable membrane between the two solutions.
    3. Less dense solution flows toward denser solution tending to equalize the two. All these conditions are met in soil water and root hairs.

### Stems

1. Origin and growth of stems.
2. Kinds of stems:
  - a. Underground:
    1. Tuber—potato.
    2. Bulb—onion.
    3. Corn—Indian turnip.
    4. Rhizome—Iris.
  - b. Aerial stems:
    1. Upright stems—trees.
    2. Twinning stems—hop vine.
    3. Scandant stems—blackberry.
    4. Running stems—strawberry.
    5. Tendrils as stems—Virginia Creeper.
    6. Thorns as stems—honey locust.
  - c. Herbaceous stems—most annual seed plants.
  - d. Woody stems—trees.
  - e. Green stems—cactus.
3. Kinds of stems as to structure:
  - a. Monocotyledons—corn.
  - b. Dicotyledons—beans.
4. Function of stems:
  - a. Connection between leaves and roots—water passage
  - b. To hold leaves up to sunlight.
  - c. To store food.
  - d. To serve as passage for manufactured food to pass down to roots.
  - e. Reproduction.

5. External characteristics of an upright typical stem: Dicotyledon.
  - a. Arrangement of buds:
    1. Terminal Bud.
    2. Lateral buds, dormant buds, adventitious buds.
  - b. Lenticels—function.
  - c. Leaf scars—cause of.
  - d. Presence of a typical bark.
  - e. Draw typical stem to show parts, X 2.
6. External characteristics of a typical upright stem; Monocotyledon:
  - a. Terminal bud present.
  - b. Lateral buds generally lacking.
  - c. Nodes and internodes.
  - d. Typical bark lacking.
  - e. Plants generally slender and tall.
  - f. Draw section of Corn stem to show parts, X 2.
7. Internal characteristics of a typical Dicotyledon stem as seen in cross section:
  - a. Epidermis.
  - b. Cortex (Collenchyma, parenchyma, chlorenchyma).
    1. Phloem region. (Sclerenchyma) sieve cells, companion cells.
  - c. Cambium region, growth region.
  - d. Xylem (woody) region.
    1. Vessels, tracheids, medullary rays.
    2. Pithy portion.
  - e. Draw cross section to show parts—low power.
8. Internal characteristics of typical monocotyledonous stem as seen in cross section.
  - a. Rind, or epidermis.
  - b. Fibro-vascular bundles scattered about stem connected by parenchymatons, or fundamental, tissue. Draw, X 10.
  - c. Parts of fibro-vascular bundle as seen in cross section:
    1. Bundle sheath.
    2. Large vessels or tracheids.

3. Small vessels, annular, spiral, and pitted vessels.
4. Sieve cells, companion cells.
5. Draw cross section of Fibro-vascular vessels as seen under low power.
9. Functions of various tissues in the stem:
  - a. Epidermal tissue.
  - b. Cortex.
  - c. Phloem, containing sieve and companion cells.
  - d. Cambium.
  - e. Xylem containing vessels, tracheids, spiral, annular and pitted vessels.

#### **Additional topics for investigation:**

1. The Transpiration Stream.
2. How does water reach to top of highest trees.
3. Economic importance of stems.
4. Killing trees by girdling. How possible.
5. Upward passage of water in stems—through what part of the stem.
6. Food stored in stems, kinds, test for.
7. Downward passage of water in stems—through what portions.
8. Twinning stems—direction of turning. Why?
9. Sleeping movements of plants.
10. The sensitive plant.
11. Heliotropism in stems.
12. Hydrotropism in stems.
13. Phototropism in stems.
14. Effect on fruit trees of presence of black alkali in soil.
15. Modifications of stems to suit environment.

#### **Leaves**

1. Origin and growth of leaves.
2. Kinds of leaves as to venation.
  - a. Parallel veined leaves.
  - b. Netted veined leaves.
    1. Pinnately veined leaves.
    2. Palmately veined leaves.
3. Parts of typical leaf:
  - a. Petiole—with or without stipules.
  - b. Blade—or lamina.



- c. Mid vein.
- d. Veins, and veinlets.
- e. Apex, margin, base.
- f. Draw leaf, X 3, to show these parts.

4. Function of leaves:

- a. To manufacture food for plant use.
- b. To store food.
- c. To propagate the species in some forms.

5. Shape of leaves:

Leaves are variously shaped. Nature seems to have two main objects in view in shaping leaves: first, to cut them into such forms that the greatest possible amount of sunlight may be caught by the plant, and second, to make them as small as possible consistent with usefulness to keep them from being torn and destroyed by the winds. In tropical regions where the forests are deep and dense many large leafed varieties of plants are found. Here in secluded and protected places strong winds are uncommon hence there is no need for dissection of leaves. On exposed windy regions, however, the reverse is the case. On desert ranges leaves are small and few to reduce transpiration.

6. Internal structure of a typical leaf:

- a. Epidermis at top and bottom, function.
- b. Palisade cells at top under epidermis, function.
- c. Spongy chlorenchyma, function.
- d. Stomata, function.
- e. Hairs, function.
- f. Draw cross section to show these parts.

7. Food manufacture by the leaf:

- a. Water and mineral salts carried to the leaf by vessels.
- b. Carbon dioxide enters leaf by means of stomata.
- c. Sunlight acting on these compounds by means of leaf green or chlorophyll produces starch or sugar.
- d. Oxygen is a by-product.
- e. Plants take in carbon dioxide and throw off oxygen thus purifying the air for animals.

Additional topics for investigation:

- 1. Difference in thickness of palisade layer, in sun leaves, and shade leaves.
- 2. Insectivorous leaves. Use to plant.

3. Leaves used as storehouses.
4. Leaves as food for animals.
5. Shedding of leaves—why.
6. Leaf coloration in autumn. Why.
7. Use of chlorophyll in leaves besides starch making.
8. Test for starch in leaves.
9. Work of leaves at night.
10. Rate of transpiration of leaves in sun, in shade.
11. Leaf mosaics.
12. Leaf tendrils.
13. Phototropism as shown by leaves.
14. Stomata on leaves of water plants.
15. Protection of leaves against freezing.

### Flowers

Flowers made their appearance very late in the plant kingdom. They appear in fossil beds simultaneously with the later insects—Bees, and Butterflies.

1. Parts of a typical flower :
  - a. Calyx—green part of flower.
  - b. Corolla—colored part of flower.
  - c. Stamen having filament and anthers.  
The anthers produce pollen.
  - d. Pistil having ovary, style, and stigma.  
The ovary produces the seed.
  - e. Draw a typical flower showing all these parts, X 3.
2. Function of flowers—to produce fruit, or seed, for the propagation of the species.
3. Flowers are :
  - a. Perfect or imperfect.
  - b. Regular or irregular.
  - c. Complete or incomplete.
4. Flowers are :
  - a. Self-pollinated or,
  - b. Cross-pollinated :
    1. By wind.
    2. Insects.
    3. By snails.
    4. By humming birds.
    5. By water.

5. Flowers are arranged :
  - a. As solitary.
  - b. In racemes.
  - c. In spikes.
  - d. In heads.
  - e. In catkins.
  - f. In corymbes.
  - g. In cymes.
  - h. In umbel.
6. Special adaptations of flowers for special methods of pollination :
  - a. Yucca.
  - b. Fig.
  - c. Lady Slipper.
7. Function of nectar in flower.
8. Purpose of coloration in flowers.
9. Difference between pollination and fertilization.

Additional topics for investigation :

1. Devices by plants to avoid self-pollination.
2. Monoecious and dioecious plants.
3. Pollination in the fig.
4. Pollination in the Yucca.
5. Ratio of pollen grains to fertilization of a plant.
6. Steps in the process of fertilization in plants.
7. Advantages to plants in cross-fertilization.
8. Dangers to plants in self-fertilization.
9. Coloration in night blooming flowers.
10. Bumble Bees and Clover seed production.
11. Pollen under the microscope.
12. Pollen germination in the laboratory.

### **Fruits**

1. Use of fruits to the species :
  - a. Protection of seeds.
  - b. Dispersal of seeds :
    1. By wind adaptations.
    2. By hooks and spines.
    3. By water adaptations.
    4. By explosive adaptations.

2. Kinds of fruits:
  - a. True fruits.
  - b. False fruits.
3. Foods contained in seed:
  - a. Starch. Test for.
  - b. Protein. Test for.
  - c. Fats and oils. Test for.
4. Germinating power of seeds.
5. Examine following fruits, or seed:
  - a. Tomato.
  - b. Apple.
  - c. Pumpkin.
  - d. Cucumber (pickle).
  - e. Corn, wheat, beans, peas, radish, parsnip, maple.

### Divisions of the Plant Kingdom

The plant kingdom is divided into the following great divisions:

1. Thallophyta—Thallus plants.
2. Bryophyta—Moss plants.
3. Pteridophyta—Fern plants.
4. Spermatophyta—Seed plants.
  - a. Gymnospermae—Cycads, Conifers.
  - b. Angiospermae—flowering plants.
    - 1<sup>1</sup>. Monocotyledonae.
    - 2<sup>1</sup>. Dicotyledonae.

### The Thallophyta

Thus far only the Angiosperms of the Spermatophyta have been studied. These are the latest of the plant kingdom to appear on earth so far as can be deduced from present knowledge.

The Thallophyta are believed to be the oldest group of plants. They are believed to be the ancestors of all plants now in existence. The term: Thallophyta means "thallus plant." A thallus is a plant body not differentiated into separated parts as leaves, stem, roots, flowers, etc.

Among the Thallophyta are to be found the simplest plants in existence. Thallophytes are divided into two great groups; Algae and Fungi. The Algae are again divided into: Blue-Green Algae, Green Algae, Brown Algae and Red Algae.

## The Algae

### Blue-Green Algae—Cyanophyceae.

1. One celled organisms. Pleurococcus.
2. Reproduction by fission as in Amoeba.
3. Contain nucleus showing starch reaction.
4. Additional forms: Nostic, Rivularia, Oscillatoria.

### Green Algae—Chlorophyceae.

1. Filamentous-Spirogyra. Habitat.
  - a. Cells joined end to end.
  - b. Each cell contains:
    - 1<sup>1</sup>. Spiral band—Chromatophore.
    - 2<sup>1</sup>. Pyrenoids.
    - 3<sup>1</sup>. Nucleus.
  - c. Draw a filament under high power.
  - d. Reproduction:
    - 1<sup>1</sup>. Vegetative—Asexual.
    - 2<sup>1</sup>. Conjugation—Sexual.

2. Branching-Cladophora, Vaucheria.

These forms are interesting to examine but for practical purposes should be deemed optional in a half years' course in Botany.

Brown Algae and Red Algae are marine forms and are called seaweeds. The Rock Fucus is common on certain coasts while the Sargassum is common in the Sargasso Sea. In an elementary course this simple mention is deemed sufficient.

## The Fungi

Fungi are vastly more important from an economic standpoint than the algae. Fungi are parasitic or saprophytic.

A parasite (botanically speaking) is a plant which lives upon a *live* organism; a saprophyte is a plant which lives upon a *dead* organism.

### Bacteria

1. Simplest of the fungi: Coccus, Spirillum, Bacillus.
2. Reproduce by fission—rapidly.
3. Habitat: in air, in water, in soil—everywhere.
4. Harmful:
  - a. Disease producing in man, beasts, plants, fruits, etc.

5. Beneficial:
  - a. As nitrifying bacteria.
  - b. In dairying.
  - c. In breaking up compounds causing decay of organisms.
  - d. In tanning.
6. Precautions against bacterial attacks:
  - a. Antitoxins.
  - b. Good health.
  - c. Germicides—fumigation, etc.
  - d. Destruction of insect carriers.
  - e. Proper disposal of garbage, sewage, etc.
7. Study under high power of microscope only. Oil immersion lens needed for demonstrative purposes. Draw three or four forms (Optional).

#### **Bread Mold** (*Mucor*, or *Rhizopus*)

1. Preparation:

Place a piece of damp bread under a glass cover and let stand for a few days.
2. Examine under low power. Note:
  - a. Branching filaments.
  - b. Fruiting stalks having black heads.
  - c. Spores composing black heads.
3. Draw under low power.
4. Reproduction—sexual and asexual.

#### **Gill Fungus** (Mushroom) (Optional)

The mushroom is the fruiting stage in the growth of the organism.

1. Examine mushroom and note:
  - a. Pileus, or cap.
  - b. Gills.
  - c. Stipes.
  - d. Attachment to soil or other anchorage.
2. Spores produced on gills.
3. Make spore print on white paper.
4. Draw longitudinal section of mushroom.
5. Report on:
  - a. Poisonous and non-poisonous mushrooms.
  - b. Economic importance of mushrooms.



**Bracket Fungus (Optional)**

Time permitting several forms of bracket fungi should be studied. These forms are very destructive to timber.

**Wheat Rust (*Puccinia Graminis*) (Optional)**

1. Occurrence.
2. Method of propagation:
  - a. Primary host—barberry leaf.
  - b. Secondary host—wheat leaf and stem.
3. Method of destruction:
  - a. Destroy the barberry plant.
4. Several species of *Puccinia* are available for study especially *P. Malvastrum* or the rust attacking the hollyhock.
5. Mash a blackspot taken from hollyhock leaf and examine under low power. Note:
  - a. Two kinds of spores.
    1. Teleutospores, uredospores. Draw them.

**The Bryophyta**

The second division in the plant kingdom is that of the Bryophyta. This division is divided into two divisions or groups: The Musci, or mosses; and the Hepaticae, or liverworts. Due to the fact that liverworts are hard to find in Colorado in all localities only the moss plant will be presented here.

**The Moss Plant (Optional)**

1. Occurrence. Natural habitat.
2. Appearance.
3. Parts:
  - a. Leafy portion with rootlike hold fasts.
  - b. A slender filament arising above the leafy portion bearing a capsule.
  - c. Leafy portion is gametophyte—sexual—generation.
  - d. Capsule and filament—sporophyte—asexual generation.
  - e. Draw moss plant to show these parts.
  - f. Split capsule with razor and examine under high power to note arrangement of spores.
4. Reproduction.
5. Protonema.

### The Pteridophyta

The third division of the plant kingdom is called the Pteridophyta, or fern plants. The plants of this division are very old and compose, in a great part, the forms which went to make up the great coal deposits of the Carboniferous. At one time ferns were very numerous and of great size. Now they are relegated to a subordinate position few being very large save the tree fern of the tropics which is often fifteen to twenty feet high with fronds (leaves) ten to twelve feet in length, while the stem or trunk is from three to five inches in diameter. Rushes and horse tails are also found in this group. At one time, like the ferns, these were very large, rushes being two feet in diameter and eighty feet tall.

#### A Fern (Optional)

Secure ordinary Boston fern for examination. Note in growing fern:

1. Very short stem.
2. Large fronds (leaves). Note method of unrolling of fronds.
3. Note fibrous roots.
4. Runners, or stolons.
5. Examine frond (leaf). Note:
  - a. Shape.
  - b. Divisions. This is a pinnate frond.
  - c. On underside note round dots—sori.
    - 1<sup>1</sup>. Filled with spore cases or sporangia.
  - d. Examine sporangium under low power. Note:
    - 1<sup>1</sup>. Stalk.
    - 2<sup>1</sup>. Spore case.
    - 3<sup>1</sup>. Annulus interrupted by stalk.
    - 4<sup>1</sup>. Spores.
6. Draw frond showing pinnae with sori on underside.
7. Draw sporangium under low power showing all parts.
8. Draw spore under high power.
9. Method of reproduction—asexual and sexual—alternation of generation.

#### Bull Rush (Optional)

Examine for joints, roughness, etc.

### **Spermatophyta (Seed Plants)**

The last division, Spermatophyta, has been studied in the division of the Angiosperms. The Spermatophyta include the Gymnosperms and Angiosperms. The term Gymnosperm means "naked seed". To this group belong the conifers or cone bearing trees such as the pines, spruces, cedars, etc.

#### **The Pine (Optional)**

1. Examine a pine, noting arrangement of branches, size of branches, etc.
2. Kind of leaves, number of leaves in a group.
3. Study cross section of leaf. Draw.
4. Study young cone-section and draw.
5. Study old cone. How do seed escape?

#### **Reference books for teacher's use and collateral reading in Biology:**

- \*General Biology—Sedgwick and Wilson.
- Applied Biology—Bigelow.
- \*Practical Biology—Smallwood.
- \*Essentials of Biology—Hunter.
- \*Biology for Beginners—Moon.
- Biology—Calkins.
- Biology—Bailey and Coleman.
- Botany for Schools—Alkinson.
- Botany of Plant Crops—Robbins.
- Fundamentals of Botany—Gager.
- Plant Anatomy—Stevens.
- Plant Physiology—Duggar.
- Plant Structures—Coulter.
- Experiments in Plants—Ostehout.
- \*Textbook in Botany—Gray.
- The Teaching Botanist—Ganong.
- \*Outlines of Botany—Leavitt.
- Botany All the Year Round—Anderson.
- Civic Biology—Hunter.
- Physiological Botany—Gray and Goodale.
- Textbook of Botany—Bessey.
- \*Textbook of Botany—Strasburger, Knoll, Schneek and Karsten.
- Blossom Hosts and Insect Guests—Gibson.

- Seed Dispersal—Beal.  
Primer of Sanitation—Ritchie.  
Story of Bacteria—Prudden.  
Infection and Immunity—Sternberg.  
Elementary Zoology—Linville and Kelly.  
General Zoology—Herrick.  
Economic Zoology—Osborne.  
Protozoa—Calkins.  
Life in Ponds and Streams—Furneaux.  
\*Invertebrate Morphology—McMurrick.  
\*The Crayfish—Huxley.  
\*Insect Book—Howard.  
\*Insect Life—Comstock.  
\*Textbook of Zoology—Packard.  
\*Insect Life of Farm and Garden—Sanderson.  
\*Insects and Insecticides—Weed.  
Insects Injurious to Vegetation—Chiltenden.  
\*Butterfly Book—Holland.  
\*Moth Book—Holland.  
Mosquitoes or Man—Boyce.  
\*Textbook of Zoology—Parker and Haswell (2 volumes).  
Birds of North America—Chapman.  
Primer of Evolution—Clodd.  
Origin of Species—Darwin.  
Descent of Man—Darwin.  
The Whence and Whither of Man—Tyler.  
Ascent of Man—Drummond.  
Anthropology—Tyler.  
\*The Next Generation—Jewett.  
The Body at Work—Gulick.  
Studies in Physiology—Peabody.  
Elementary Physiology—Huxlay.  
\*General Physiology—Eddy.  
The World's Commercial Products—Freeman and Chandler.  
Plants and Their Uses—Sargent.  
Domesticated Plants and Animals—Davenport.  
Practical Agriculture—Wilkinson.  
Principles of Agriculture—Bailey.  
The Fertility of the Land—Roberts.  
\*Milk and Its Products—Wing.  
Types and Breeds of Farm Animals—Plumb.

Principles of Breeding—Davenport.

\*Biology and Its Makers—Lacy.

\*Life of Pasteur—Frankland.

\*Children's Stories of Great Scientists—Wright.

\*Mechanism of Mendelian Heredity—Morgan.

Manual of Zoology—Hertwig-Kingsley.

It is not expected that every High School will be able to secure all the texts and reference books included in this list. However, it should be the aim of the Biology teacher or teachers to secure as many as possible. Reference books should be kept in close proximity to the Biology room, if not in the room, that pupils may have ready access to them for reading at, otherwise, idle moments. The pupil should be encouraged to read widely in the field of Biology. Too often instruction in this subject is confined to the textbook in hand and, upon the completion of the text, the pupil assumes that he has covered the Biological realm. Could he be brought to realize the vastness and importance of Biology; its contact with our everyday life; its influence upon our philosophies of education, government, and nationalities; upon medicine, both operative and preventive, upon agriculture, forestry, pomology, sericulture, he would determine to delve deeper into this great science of life.





ARY

OUTLINE  
OF  
PHYSICS



## PHYSICS

Every definition of a unit of Physics which will be accepted for college entrance requires, very definitely, three distinct forms of instruction. A combination of these three seems to be absolutely necessary in order to give to young students any genuine knowledge of Physics, and the relative importance of the three is so nearly equal that different writers on the subject of teaching Physics place in different orders. They are:

First: The lecture-table demonstrations by the teacher.

Second: The study of one standard textbook, in addition to which the student should consult books of reference and other scientific literature.

Third: Individual laboratory work, consisting of at least 30 exercises requiring at least the time of 30 double periods. The double period of laboratory work counting as equivalent to one period of classroom work.

These are minimum requirements; in good schools there are two double periods per week for laboratory work and in some cases a double period for classroom work also making five double periods per week for thirty-six weeks. The minimum length of a period is forty minutes. The definition of a standard course in Physics must, therefore, include this fundamental requirement of time in addition to the other three.

First: The time given to Physics shall be three single periods of forty minutes per week for classroom work and demonstrations by the teacher and two double periods per week for laboratory work.

Second: The demonstrations by the teacher shall cover all the more important principles and phenomena of Physics and should include at least eighty per cent of the following list in each of the four divisions of the subject. If it is impossible to meet the requirement, on account of inadequate equipment, arrangements must be made for the class to visit some well equipped laboratory a sufficient number of times during the year to enable them to see the phenomena which can not be shown them at home.

Fourth: The individual laboratory work of the students shall comprise at least one exercise from each of the thirty groups in the following list except that laboratory "projects" from the supplementary list, may be substituted for some of these at the discretion of the teacher. It is recommended that several different

laboratory manuals be purchased for the class and used as books of reference only instead of following one manual through.

A certain amount of laboratory equipment is absolutely necessary for a course in Physics and unless this can be provided the course should not be offered. For a class of not more than four or five the minimum equipment can be bought for about fifty dollars, but this small amount is not recommended. The appropriation should be at least one hundred dollars, if possible.

List of class demonstrations. At least 80 per cent of the subjects listed in each section should be demonstrated in class.

### **1—Mechanics.**

- 1—Uniformly accelerated motion (Galileo's experiment).
- 2—Atwood's machine (relation of force, inertia, and velocity).
- 3—Centrifugal force.
- 4—Concurrent forces, parallelogram of forces.
- 5—Parallel forces, principle of moments—illustrated by the lever.
- 6—Mechanical advantage—illustrated by pulleys or wheels and axle.
- 7—Center of gravity and equilibrium.
- 8—Pressure in liquids.
- 9—Buoyancy, demonstration of hydrometer.
- 10—Cohesion of water.
- 11—Surface tension.
- 12—Capillary phenomena.
- 13—Weight of air. (A burned out light globe may be used).
- 14—Pressure of atmosphere.
- 15—The siphon, or model pumps.

### **2—Molecular mechanics and heat.**

- 1—Expansion of air.
- 2—Boyle's Law.
- 3—Diffusion of hydrogen gas through a porus cup.
- 4—Absorbtion of ammonia gas by charcoal.
- 5—Absorbtion of ammonia gas in water.
- 6—Saturated vapors and vapor pressure.
- 7—Cooling by evaporation.
- 8—Thermal expansion of liquids, thermometer.
- 9—Thermal expansion of gases, the air thermometer.
- 10—Specific heat of mercury.
- 11—Distillation.

- 12—Heat absorbed when a solid dissolves.
- 13—Heat liberated when a super-saturated solution crystalizes.
- 14—Heat conductivity.
- 15—Convection (liquids and gases).

### **3—Electricity.**

- 1—Properties of magnets.
- 2—Earth's Magnetism—dipping needle, etc.
- 3—Frictional electricity—attraction and repulsion.
- 4—Electroscope and electrostatic induction.
- 5—Discharging effect of points.
- 6—Electric machine.
- 7—Condensers, Leyden jar.
- 8—Galvanic cell.
- 9—Effect of current on magnetic needle.
- 10—Principle of the galvanometer.
- 11—Electrolysis of water.
- 12—Principle of the storage cell.
- 13—Magnetic properties of a helix.
- 14—Heating effect of a current.
- 15—The arc light.
- 16—Electromagnetic induction.
- 17—Principle of the electric motor.
- 18—Principle of the induction coil and transformer.

### **4—Sound and Light.**

- 1—Wave motion (wave machine or water waves).
- 2—Resonance.
- 3—Beats.
- 4—Analysis of sounds by manometric flame or by resonance.
- 5—Path of a ray of light through water.
- 6—Interference of sodium light.
- 7—Polarized light.
- 8—Rumford photometer—law of inverse squares.
- 9—Projection lantern or other optical instrument.
- 10—Dispersion of light by a prism.
- 11—Effect of colored light on colored objects.
- 12—Subjective colors, complementary colors.
- 13—Bright-line spectra.
- 14—The solar spectrum, Fraunhofer lines.
- 15—Reflection of infra-red rays.
- 16—Crookes' tube or X-ray tube.
- 17—Becquerel rays.

**Laboratory Exercises in Mechanics**

- 1—
  - a—Does the period of a pendulum depend on the weight of the bob or on the amplitude of vibration?
  - b—What is the relation between the length of a pendulum and the period of vibration?
  - c—What facts determine the period of a torsion pendulum?
  - d—Study of inertia by means of a spiral spring.
  - e—Study of force and inertia with Atwood's machine.
- 2—
  - a—To draw a graph showing relation between the length and time of vibration of pendulum using data obtained by class.
  - b—To draw a graph showing the distance traversed by falling body in each second up to the eighth, also the total distance. (Two graphs on the same sheet).
- 3—
  - a—Study of Hooke's law in torsion or flexure.
  - b—Testing the strength of wires of different materials and sizes.
  - c—To determine Young's modulus and the elastic limit of steel.
  - d—Deflection of a beam, relation between stiffness and depth.
- 4—
  - a—Equilibrium of concurrent forces, constructing parallelograms.
  - b—Study of stresses in a derrick.
  - c—Study of stresses in a truss.
- 5—
  - a—Study of a straight lever and principle of moments.
  - b—To find the reaction of a beam with different positions of the loads.
  - c—To find the reaction of a cantilever beam.
  - d—Equilibrium of 4 forces at right angles in the same plane.
- 6—
  - a—To find the mechanical advantage of a system of pulleys.
  - b—To find the mechanical advantage of a compound lever.
  - c—To find the mechanical advantage of an inclined plane.
  - d—To find the mechanical advantage of a bicycle.
- 7—
  - a—To determine the efficiency of an inclined plane.
  - b—To determine the efficiency of a system of pulleys.
  - c—To determine the efficiency of a differential pulley.
  - d—To determine the co-efficient of a friction for smooth wood.



- 8— a—To determine the density of a metal bar by measurement.  
b—To determine the specific gravity of a solid by weight in water.  
c—To determine the specific gravity with Nicholson's hydrometer.  
d—To determine the specific gravity of a solid lighter than water.
- 9— a—To determine the specific gravity of a liquid by balancing column.  
b—To determine the specific gravity of a liquid by Archimedes principle.  
c—To determine the specific gravity of a liquid by Hare's method.  
d—To determine the specific gravity of a solid soluble in water.

### Heat

- 1— a—Measurement of linear expansion of metal rod.  
b—Measurement of cubical expansion of water.  
c—Measurement of cubical expansion of mercury.  
d—Measurement of cubical expansion of TOLUENE, ACETONE or BENZOL.
- 2— a—Co-efficient of expansion of a gas at constant pressure.  
b—Relation between temperature and pressure of a gas at constant volume.  
c—Determination of absolute zero with constant volume air thermometer.
- 3— a—Relation between pressure of steam and temperature.  
b—Boiling point of water at reduced pressure.  
c—Boiling point of alcohol or gasoline.  
d—Boiling point of ether by vapor pressure.
- 4— a—Determination of specific heat of a solid.  
b—Determination of specific heat of a liquid.  
c—Determination of the melting point of naphthalene.
- 5— a—Determination of the heat of fusion of ice.  
b—Determination of the latent heat of steam.  
c—Determination of the heat of vaporization of water at 20°C.  
d—Determination of the heat of fusion of benzol.

- 6—
  - a—To plot a cooling curve through change of state for either of the following substances: acetamid, naphthalene, sodium thiosulphate (hypo), paraffine.
  - b—To plot a cooling curve for melted sulphur.
  - c—To plot a cooling curve for water from  $5^{\circ}$  to  $5^{\circ}\text{C}$ .
- 7—
  - a—Determination of dew point and relative humidity.
  - b—Determination of vapor pressure of ether or benzol at different temperatures.
  - c—Determination of vapor pressure of water at different temperatures.
  - d—Determination of vapor pressure of a solution.
  - e—Study of fractional distillation (gasoline, kerosene, or crude oil).
- 8—
  - a—Laboratory exercises on electricity.
  - 1—a—Electromotive force of simple cell with different electrodes.
  - b—Electromotive force of simple cell with different electrolytes.
  - c—Study of polarization and depolarizing agents.
  - d—Study of a two-fluid cell.
  - 2—a—Electrolysis of copper sulphate.
  - b—Measurement of quantity of electricity with coulometer.
  - c—Principle of the storage battery.
  - d—Principle of the electrolytic rectifier.
  - 3—a—Measurement of resistance of wires with galvanoscope.
  - b—Measurement of resistance by volt-ammeter method.
  - c—Measurement of resistance with Wheatstone bridge.
  - 4—a—Measurement of resistance of two lamps in series and then in parallel.
  - b—Measurement of internal resistance of a battery.
  - c—Is the resistance of a carbon filament lamp greater when hot or when cold? How much?
  - d—Is the resistance of a tungsten filament lamp greater when hot or cold? How much?
  - 5—a—Determination of the mechanical equivalent of heat by means of heating coil and calorimeter.
  - b—Determination of temperature co-efficient of resistance of a copper wire.
  - c—Study of thermo-electric currents.
  - d—How large does a wire have to be to carry 10 amperes? What determines the carrying capacity?

- 6—a—Mapping the lines of force in a magnetic field with an exploring compass, also with iron fillings.
  - b—To determine strength of the earth's magnetic field at two different points by oscillations of suspended magnet.
  - c—Study of magnetic permeability with simple magnetoscope.
  - 7—a—Study of the action of an electric motor with the "St. Louis" motor or with improvised apparatus.
  - b—Determination of the efficiency of an electric motor.
  - c—Study of the action of a magneto electric machine.
- If the laboratory is lighted by alternating current some exercises to show the peculiarities of this form of current should be substituted for some of those given above.

### **Laboratory Exercises on Sound and Light**

- 1—a—Measurement of the velocity of sound.
- b—Measurement of wave length of a musical sound by resonance.
- c—Study of the interference of sound waves.
- 2—a—Study of the vibration of stretched wires.
- b—Study of the vibration of a bar fixed at one end.
- c—To determine the vibration rate of a tuning fork.
- d—To plot the sine curve and the resultant of two waves.
- e—To determine the frequency of an alternating electric current by the rate of the vibration it produces in a wire.
- 3—a—To measure the relative intensity of two lights with a Buns photometer.
- b—Relation between an object and its image in a plane mirror.
- c—Relation between an object and its image in a spherical mirror.
- 4—a—To find the focal length of a convex lens.
- b—To find the magnifying power of a lens.
- c—To arrange a system of lenses equivalent to a telescope.
- d—To arrange a system of lenses equivalent to a microscope.
- 5—a—To determine the index of refraction for glass.
- b—To determine the index of refraction for water or turpentine.

- c—To determine the critical angle of glass.
- d—To find the difference between meniscus, rectilinear, and anastigmatic photographic lenses.
- 6—
  - a—Study of bright-line spectra with plate glass prism.
  - b—Study of bright-line spectra with spectroscope.
  - c—Study of absorption spectra with the spectroscope.
  - d—To measure the wave length of sodium light by interference.
  - e—To measure the wave length of sodium light with a spectrometer.
- 7—
  - a—Study of radiation and absorption of heat rays.
  - b—Construction of a “coherer” and detection of electric waves.
  - c—Study of compound colors, with a rotator or by reflection.
  - d—Study of polarized light with reflecting polariscope.

Any of the following “projects” may be substituted for an equivalent amount of regular laboratory exercises if the teacher considers desirable.

## SUGGESTED PROJECTS IN PHYSICS

### Mechanics

- 1— Construction of a model bridge truss and determination of the stresses in the different members.
- 2— Construction of a model derrick and determination of the stress and mechanical advantage.
- 3— Study of the system of levers in a wagon scales. Make a diagram and calculate the mechanical advantage.
- 4— Does the hardening of steel increase the modulus of elasticity or only the elastic limit?
- 5— Is a thick wire stronger in proportion to its size than a thin wire or is the strength proportional to the size? (Conclusion must be based on a sufficient number of tests to eliminate chance).

### Heat

- 1— Is the co-efficient of expansion of a mixture of two liquids the average of the two taken separately?
- 2— What effect does salt in water have on the co-efficient of expansion?

- 3— Fractional distillation of coal tar and study of physical properties of the substances derived from it.
- 4— Construction of a thermostat.
- 5— Construction of a toluene thermometer on a large scale.
- 6— Construction of a model hot-water heating system of glass.

### Electricity

- 1— To construct an electric bell.
- 2— To construct an induction coil.
- 3— To construct a hot wire ammeter and calibrate it.
- 4— To construct an astatic galvanometer.
- 5— To construct a Tesla coil or Oudin resonator.
- 6— To construct a large electro-magnet.
- 7— To construct an electrophorus and other electrostatic apparatus.

### Sound and Light

- 1— To construct a Tisley harmonograph to show the combination of two vibrations at right angles to each other.
- 2— To construct an acoustic telephone.
- 3— To construct a sonometer.
- 4— To construct a Bunsen photometer.
- 5— To construct a pinhole camera and make photographs with it.





OUTLINE  
OF  
CHEMISTRY



## CHEMISTRY

### First Semester

**General Aim:** To sell to the pupils an abiding interest in chemistry, both industrial and theoretical. This is due them and is an essential part of good citizenship in a country which is to be advanced and even defended from aggression by means of a full knowledge and application of this science.

### Introduction to Chemistry

A brief history is of interest here; alchemists, elixer of life, etc. *Chemical Change* (defined and explained and contrasted in class and laboratory with physical changes).

Lavoisier's experiment, the beginning of chemistry as a science.

States of matter.

Compounds and elements.

#### Oxygen:

Methods of making: laboratory 2, industrial 2.

When discovered? By whom?

Importance, occurrence, properties, etc.

Meaning of oxidation.

Definitions of oxide, catalytic, combustion, rusting, etc.

#### Hydrogen:

Three means of preparation.

Physical properties.

Chemical properties:

Water formation.

Meaning of reduction.

Commercial preparation and uses.

Hydrogenation of oils with further discussion of catalysis.

Review of arithmetic (if needed).

Percentage with problems taken from chemical analysis.

Decimals with a study of the metric system of weights and measures.

Proportion (inverse as well as direct).

#### Gases and Their Measurement.

Changes of pressure and temperatures as they affect the volume of a gas.

Measurement of air pressure.

Study of the barometer.

Charles' Law with its use in correcting gas volume.  
Boyle's Law with its use in correcting gas volume.  
Simultaneous correction for temperature and pressure.  
Correction for vapor tension (*optional with teacher*).  
Problems involving gas measurement and changes in temperature and pressure.

**Analysis and Synthesis:**

(Unless scales are reliable, omit the exercises concerning weights.)

Synthesis by volume.  
Synthesis by weight.  
Law of definite proportion.  
Equivalent weights of the elements.

**Atoms and Molecules**—The terms should have been made clear from the first day and chemical change and physical change should be explained on the second day of the term by means of the atomic hypothesis and in terms of the molecule.

Law of the conservation of mass.  
Formal presentation of the atomic hypothesis.  
Definition of matter, atom, molecule, hypothesis, theory, law.  
Definition of the law of definite proportion.  
Relation of reacting to atomic weight.

**Water and Solution:**

Five physical standards or units based upon properties of water.  
Definition of heat of vaporization, heat of fusion, calorie.  
Comparison of thermometer scales, problems.  
Definition of distillation, solution, suspension, solvent, solute, miscible, saturation, super saturation, crystal, water of crystallization, efflorescence, deliquescence, hygroscopic.  
Explanation of freezing mixtures.  
Properties of a solution.

**Chlorine:**

Preparation and manufacture.  
Properties, chemical and physical.  
Explanation of bleaching action and disinfection.  
Chlorine yielding compounds.

**Hydrogen Chloride:**

Preparation of hydrochloric acid.  
General method for preparing acids.

Properties of HCl.

Typical properties of acids.

Test for chlorides.

Uses and occurrence of HCl.

Analysis and synthesis of HCl leading up to the composition of the molecule of a gas.

### **Molecular Composition:**

Volume relation of gases.

Law of Gay-Lussac.

Review of Boyle's and Charles' Laws.

Avagadro's hypothesis.

Proof that the molecule of the common gases contains 2 atoms.

Explanation of physical and chemical changes.

### **Atomic and Molecular Weights:**

Definition of atomic weight, density, and specific gravity.

Density and specific gravity as applied to solids, liquids and gases; molecular weight.

Determination of the molecular weight of substances which may be turned into gases.

### **Symbols and Formulas:**

Significance of symbol.

Significance of formula.

The use of coefficients and subscript numbers.

Calculation of the formula (problems).

Calculation of percentage composition (problems).

### **The Writing of Formulas:**

Valence.

Variation in valence.

Combination of elements and formula writing (board work and much practice).

### **The Naming of Compounds:**

Twelve common acids, two names for each, names of their salts.

Names, symbols, and valences of twenty elements.

Practice with combination of positive elements with negative elements and radicals.

Preparation of a table of 150 or more combinations.

### **Chemical Equations:**

Types of chemical changes.

Four things which must be known before writing equation.

Much practice with board and by assignment.

**Chemical Calculations:**

- Calculation of weights from the equation.
- Problems involving weight only.
- Problems involving volume only.
- Practice problems.

**Sodium and Potassium:**

- Preparation of the metals sodium and potassium.
- Their properties and uses.
- Add material about lithium and other members of family.
- Introduce subject of periodic law (not extensively).

**Lecture on Periodic Law, Relation of Elements to Each Other:****Stellar Chemistry and Spectrum Analysis:****Ionization:**

- Conducting power of solutions.
- Electrolytes and non-electrolytes.
- Freezing-point and boiling-point changes due to dissolved substances.
- Osmotic pressure defined and how used to determine molecular weights.
- Osmotic pressure as shown by chemical flower garden.
- Dissociation and extent, how measured.
- Ions.
- Electrolysis.
- All-inclusive definitions of acid, base, and salt.
- Neutralization.
- Valence explained.

**Chemical Equilibrium:**

- Reversible reactions and dynamic equilibrium.
- Three kinds of reactions which go to an end.
- The law of mass action.

**Sodium and Potassium Compounds:**

- Likenesses and points of dissimilarity of Na and K.
- Sodium Hydroxide and Potassium Hydroxide.
  - Two methods of preparation with equations.
  - Properties and uses.
- Sodium chloride—Uses of NaCl and KCl.
  - Several sources and means of preparation and recovery.
- The Solvay process for preparation of the carbonates.
  - Equations.
- Explanation of hydrolysis.



**The Alkali Nitrates:**

Occurrence, importance, points of contrast, uses of each.

Sodium peroxide.

**CHEMISTRY****Second Semester**

In the study for the second semester, the use of the chemical equation and its significance should be shown. The periodic table should be approached gradually so the student will not be entirely unprepared for it when it comes up in the text.

Oxidation and reduction equations should be studied at every opportunity and their general value shown.

In any metals that may occur, it will be well to learn at least one of the principal ores and the characteristics of the ore. The table and its symbols should be learned as the student progresses, and constant drill should keep the table before the student.

The instructor should perform any experiments that he may where there is apparatus available. He should be careful to try the experiments a day in advance of the demonstration to insure the correct results and to avoid all confusion in the laboratory.

**Sulphur:**

Methods of obtaining, etc., emphasizing all allotropic forms. Oxides of sulphur and acids, emphasize uses, sulphuric acid by contact process, and chamber process. Equations, start on simple oxidation and reduction equations at this time.

**Nitrogen:**

Occurrence, uses as fertilizer, and the explosive properties of the compounds emphasized.

Composition of the air.

Uses of helium.

Emphasize the common compounds of nitrogen and their uses.

Explain oxidation of aqua regia, and nitric acid.

Processes for the fixation of nitrogen.

**Nitrogen Group:**

Phosphorous compounds, and their uses.

Phosphorous poisoning.

As, Sb, and Bi and their uses as alloys.

Type metal and fusible valve controls.

**Halogens:**

Uses of the chlorine compounds and their chemical names, particularly the salts and their relation to the acid from which they are derived, such as chloride, hypochloride, chlorite, chlorate, and the perchlorate. The theory of the chemical formation of the various acids that may be formed from a substance and the corresponding salt and its name.

Bromine and its uses in the laboratory and in medicine.

Iodine, same.

Fluorine briefly, mentioning little other than the etching of glass.

Show how in this case as previously the periodic table works out and do not fail to gradually bring the attention of the student to this phenomena, groups and periods so that he will be readily familiar with the relations of the groups and their valences.

**Carbon:**

A very important element requiring close attention to:

- a. Occurrence.
- b. Forms.
- c. Crystallography.
- d. Inorganic compounds.
- e. Very elementary organic compounds.

Supplement the text with what material may be available.

Show graphically the construction of simple organic compounds such as  $\text{CO}_2$ ,  $\text{OH}_4$ ,  $\text{CaCO}_3$ ,  $\text{CO}$ , showing that the valence of carbon varies and that it reacts both positively and negatively with H and O in compounds as above.

Fuels. Show the general structure of the hydro carbon and its use as a fuel. Gases, natural and produced, taken up briefly. Incandescence of flame. Oxidizing and reducing flames. Uses of the blowpipe, and explanation. Distillation explosives, etc., briefly. Use many equations.

**Colloids—Optional:**

Show difference between colloids, suspensions, and solutions.

Explain the part that ionization has in the formation of a sol.

Illustrate if possible by precipitation of  $\text{As}_2\text{S}_3$  in pure water and then the difference upon the addition of a highly ionized salt such as  $\text{NaCl}$ .

The ultramicroscope.

Differentiate between organic and inorganic colloids.

Explain thoroughly at this time absorption.

### **Silicon and Boron—Optional:**

#### **Calcium:**

General use of the compounds. Plaster, lime, and bleaching powder studied.

Mg, Zn, and Hg.

Briefly mention asbestos, metallic Mg, and medicinal properties. Zn as an alloy, galvanizing, commercial use of ZnO, as paint base.

Amalgams defined and studied as alloys. Fulminates, and reactions with CN radical studied. Medicinal uses.

#### **Iron and Steel:**

A very important subject because of the universal need of iron products. Give a rather technical explanation of the reactions that take place in the blast furnace. See that the classification of steel products is well learned, and that the properties of the different classes are understood. Then see that the detrimental effects of P, S, Si, C, are noticed. Touch briefly on the "higher-metal alloys", such as Mn, Mo, Ni, Va. Take up the oxides of iron in the study of the metallurgy of steel.

#### **Copper:**

Occurrence, smelting and the reactions in the smelter.

Production of matte and blister copper, poling and electrolysis.

Commercial uses of copper and its compounds.

Ag, Cu, Au, and Pt.

Uses of these as alloys and of Au and Pt as non-corrodible agents.

Commercial uses of Ag and its compounds in photography.

Discuss thoroughly exposure, developing, and fixing. Use of Cu as an alloy with these other metals, briefly.

#### **Aluminum:**

Occurrence. Reduction. Uses and properties of metal.

The following is optional with teacher. Study the chemical peculiarities of this metal along with Bi, Sn, and Zn, in their reaction to strong bases and acids. Study alums briefly along with silicates, and use of oxides in cement and concrete.

**Tin:**

Uses of metallic tin and lead. Compounds of each. Study the electrochemical series thoroughly.

**Periodic Table:**

Study carefully, showing the changes in valence to O and H according to periods. The change in physical and chemical properties in the group according to the increase in the atomic weight. Emphasize the value of the Mendelejeff table and drill on the elements by name and symbol.

**Radium:**

Occurrence and medical uses.

Be sure that the name Curie stays with the pupil.

If there is time for additional work, lectures on atomic structure could be given and supplementary reading about industrial chemistry should be added.

OUTLINE  
OF  
PHYSICAL EDUCATION





## PHYSICAL EDUCATION

### INTRODUCTION

#### (A) General

Never was the need for the promotion of physical education so thoroughly realized as today. Physical education, meaning the scientific training of children in physical and health activities and acting as an agent to stimulate certain mental qualifications that are so necessary to success, is coming to be considered one of the essentials in the education of the child.

#### (B) Aims

The primary aim of physical education is the physical development of those who are inferior and defective, and the general improvement of all. Recent statistics show that a large per cent of the boys and girls of school age in Colorado have physical defects and ailments that retard normal development. This teaches us that conditions at home and in school are to a certain extent unhygienic, and that they lack instruction in physical education and health activities necessary to their well being. Then it is evident that physical education should be given a definite place in our educational system.

#### (C) Features of Content

The general trend of physical education is toward the informal type, nevertheless, a certain amount of formal drill is very necessary. In this outline we will eliminate all formal drill except for a period of seven or eight minutes at the beginning of every period which should be devoted to calisthenic drill. It has been found that students easily tire of formal drills, and we are therefore reducing it to a minimum as the marches, etc., lend little aid to our work. Calisthenics are very important, the values of which are noted in this outline.

The rest of the period we would devote to organized play, dividing the period into two parts, the first in which the fundamentals of our popular games are taught, the second in which the play of these games actually are put in practice. The game to be used depends upon the season of the year, as football in the fall, tennis in the fall and spring, track and field in the spring, basketball, volley ball, handball, etc., during the winter months.

As to the methods of teaching this kind of course, several

things may be said. The teacher must have discipline, or all is lost. She or he must be, or must become, very familiar with methods of calisthenic drill, and must be very familiar with the popular games.

The teacher must have a special interest in every student and should watch and measure that student's development. Some need lots of hard exercise, others cannot stand so much. Some are too willing and are likely to over do, while others are likely to be lazy. In using this system, however, it has been found that every child gets plenty of good exercise, because the spirit of competition is there, and every red blooded boy or girl wants to win. And if we can teach them to want to win, and win in view of high ethical standards, we will develop them faster physically and will develop certain mental qualifications, that every real winner possesses, namely, aggressiveness, obedience, concentration of mind, determination and co-operation. These mental qualifications are necessary for success, and the teacher that can develop these, as well as simply giving exercises, is the teacher we need in our physical education departments today.

Physical education should have a regular place in the daily schedule, each student should be given one period per day (five periods per week), physical education is hardly worth while if each child gets less than three periods per week. The amount of work to be covered each month in calisthenics can be taken from any recognized manual of calisthenic drill. The amount to be done each month in organized play depends directly upon the class and its teacher. During the season of basketball, as much of the game as possible should be taught and played, the same is true with other games during their particular season.

The object of this outline is to give the teachers of the state of Colorado some practical methods for developing a program of Physical Education suitable to their need.

### Organization

1. Students must be on time.
  - a. Certain time should be given for dressing.
2. Seven to eight minutes of calisthenic drill.
  - a. System to be used—taken from any reorganized manual of calisthenic drill.

3. First part of period of organized play to be about 15 minutes in length.
  - a. Period to be used in teaching the fundamentals of our popular games—interpretation of rules, passing the ball, blocking, kicking, basket shooting, pivots, proper strokes in tennis, swimming, etc.
4. Second part of period of organized play to be 20 minutes in length.
  - a. Choose up sides, or instructor name sides. Engage in regular games, get spirit of competition.
  - b. Football must be excluded as a regular game, because lack of equipment. However, many exercises in teaching fundamentals of football can be used to a great advantage. All other games such as basketball, volley ball, tennis, track and field, swimming, wrestling, and boxing, can be taught and then practiced.
  - c. Time should be given for quick shower bath before next class.
  - d. Making the students step lively is a great part of the training.

### Inter Class and Inter School Athletics

1. All students should be urged to try for school teams.
2. Inter school athletics must be handled by a director who is of excellent character and personality, and one who possesses the spirit of fair play.
3. Definite rules must govern the eligibility of the pupils competing.
4. All students should be fit both physically and scholastically before being allowed to participate.
5. Training rules should be followed carefully and the director must exert special effort to put across the idea of clean living.
6. Awards, such as letters, sweaters, medals, etc., should be given those performing in a perfect manner. This encourages others to try these various games and events.
7. In this department is the best place to develop the mental qualifications mentioned in the introduction, although they can be cultivated to certain extent in the regular classes.

8. The spirit of winning developed here will not make good citizens, except when the spirit of absolutely fair competition is prevalent.

### Methods of Measurement

If physical education is to be placed on the same level with the other high school subjects, it must be handled in a similar manner. It must be graded and standardized. The following outline may be used as a basis for a system of grading physical education in your high school.

|   |     |
|---|-----|
| 1. Formal exercise.....                         | 20  |
| a. Calisthenics.                                |     |
| 2. Organized play or athletics.....             | 25  |
| a. Effort.                                      |     |
| b. Ability.                                     |     |
| c. Knowledge of games.                          |     |
| 3. Mental qualifications .....                  | 30  |
| a. Aggressiveness.                              |     |
| b. Obedience.                                   |     |
| c. Co-operation.                                |     |
| d. Determination.                               |     |
| e. Concentration of mind.                       |     |
| 4. Health habits.....                           | 25  |
| a. Cleanliness and neatness.                    |     |
| b. Care of body, teeth, hair, hands, feet, etc. |     |
| Total points .....                              | 100 |

### Bibliography

#### A. Calisthenic drill.

1. Methods in physical education by O. E. Bird, Professor of Physical Education, Ohio University, Athens, Ohio. Published by the author.
2. Any Drill Manual of the U. S. Army.

**B. Organized play.**

1. Wilson's Athletic Library. Deals with all popular games in detail. Sold by any Sporting Goods Company.
2. How to be an Athlete, by Lungren and Hammett.
3. Track and Field Athletics, by Harry Gill.
4. Games, Contests and Relays, by Seward Charles Staley.
5. A Manual of Football, by Chas. C. Allen.

Note: All these books can be purchased from any Sporting Goods Company.





OUTLINE  
OF  
HOME ECONOMICS



## HOME ECONOMICS

For general introduction to Home Economics see Junior High School outlines.

### Advanced Foods

Eleventh Grade. Elective. Double periods daily, first semester.

#### I. Objectives.

1. To prepare the student to select intelligently foods that will meet her own requirement.
2. To acquaint student with some of the factors that govern the choice of foods necessary to the needs of other members of the family group, i. e., the infant, the pre-school age child, the rapidly growing boy, parents, and elderly members of the household.
3. To help the student to acquire better technical skill to the degree that it shall enable her to.
  - a. Render better personal service to the immediate family group.
  - b. Better recognize standards for food products.
4. To develop some ability in preparing food combinations that shall be at once pleasing to the eye as well as palatable.
5. To promote habits of thought and the desire to seek for truth through providing stimulating laboratory problems.
6. To give an incentive to continue food study after school days are over.

## Advanced Foods

**General Plan**—The first two-thirds of the semester to be spent in the study of principles that underlie selection and preparation of foods. So far as possible the laboratory procedure should be according to methods evolved and tested in experimental laboratories. The able teacher will direct to the use of the bulletins and reference material giving scientific findings in very readable form. The last third of the course to be given over to the preparation and serving of meals to meet typical home needs. The earlier laboratory practices will then be put to the test and basic recipes be made convenient tools.

| Topics   | Subject Matter and Procedure   | Home Activities   | Remarks   |
|--|--|---|---|
| 1. Health habits.  | Discussion of health habits. Use of score card in grading one's own health. Discussion of current physical defects as revealed in records and reports of Colorado State Board of Health, Census Bureau, and reports of war department on defects shown in the draft. |   | During the first week there may be on some days a margin of time toward the close of the period. That time can be used to advantage on miscellaneous laboratory problems by which the student may be the better prepared to work rapidly when the food preparation work is begun, i. e., measurements, house-keeping duties, etc. |
| 2. The nature of food classification. Guide to food selection. | Food classification a necessary first step to intelligent choice of food. Acceptance and test by class of some usable guide to food selection. Especial emphasis on the mineral nutrients that cannot be safely left to chance. Tabulation of                        | Student to make record of amounts and kinds of food eaten on this day. This is to be used in connection with discussion in lessons 3-6. | Guide to food selection must be simple enough to be placed in the hands of one not trained in nutrition and to—possible where limited financial resources.  |

amounts of common foods required to yield each of the three minerals especially considered. Emphasis of the need for vitamin rich foods.

3-4. Energy requirement of the body and calorie studies.

Consideration of unit used in measuring energy requirement. Calculation of the individual student's approximate need. Weighing and measuring of the standard portions (100 calorie portions) of a number of common foods—that to enable students to approximate the calorie value of her own food intake. Use "Guide to Food Selection" to aid in selecting from standard portions set out a day's food supply adequate to the student's need. Consideration of the protein and fat needs of the body.

5. What becomes of food?

In this review of physiology there should be especial emphasis on how the end products are disposed of and what becomes of the excess of each food constituent beyond what is used by the body to build, to repair, for regulatory processes and for fuel and energy. Discussion of immediate causes of atonic constipation, of symptoms and of results. Corrective diet vs. purgatives.

Student to record the calorific value of food intake for the day to follow these studies. Note any changes in forms of record and of food habits on the two days.

A few 100-calorie portions and inexpensive foods may be provided here. And this supplemented by tabulations showing standard portions of other foods. Then as each individual food is taken up—a standard portion may be weighed out.

The matter of corrective diet is one that calls for very careful and effective work on the part of the teacher both in preparation for class and individual work with class.

| Topics  | Subject Matter and Procedure   | Home Activities  | Remarks   |
|---|--|--|---|
| 6. The health record.   | Preparation of a health record sheet giving weight curve of the student herself. In cases in which the student's health card report is very favorable she may arrange with a volunteer from the family group or otherwise for her project on "The Correction of Faulty Health Habits." Conference periods to be arranged for in which will be discussed the individual problems of the girl.   | Enlist the interest and support of family in home project work.  |   |
| 7. The laboratory and some of its methods.                          | Survey of laboratory arrangement and equipment. Study of measurements and special measuring devices that may be available.   | Compare in operation the home stove and other equipment with that of the school laboratory.  |   |
| 8. Uses of water in cookery. Beverages and suitable accompaniments. | Uses of water in cookery enumerated and discussed. Experiments formulated to show the uses of water in replacing that lost through evaporation, i. e., dried fruits, wilted vegetables, eggs. Practical work showing the use of water as a medium for carrying flavor.<br>A. Fruit punch. Serve with wafers.<br>B. Preparation of tea. Serve with toast and with marguerites.<br>C. Preparation of coffee. Serve with cheese wafers. | Class in home economics may find opportunity to prepare in large quantity for some special events the beverages and accompaniments suggested here. | Emphasis on the fact that to excellently prepare and serve very simple food is far better than to provide poor quality with elaboration. Throughout the work in food preparation—there may be used illustrative material and charts to advantage. Optional experiments and exercises should be provided throughout the work of the course to meet the needs and interests of the exceptional student. |



9. Cocoa, chocolate and sandwiches. Consideration of differences between cocoa and chocolate. Prepare according to directions supplied. Compare in taste. Serve with suitable (not wasteful) bread and butter sandwiches. Demonstration of attractive and sensible type, of sandwiches by teacher, i. e., sandwiches with crusts left on.

10. Fruit and vegetables in the diet. Values of fruits and vegetables from the viewpoints of vitamins, mineral nutrients, sugars:

1. Importance of one particular group with vitamins in relation to the teeth—vitamin C.
2. Importance of bulk in the food in relation to use of lime salts of the food by the body.
3. Importance from viewpoint of the residue they give when burned. Photographic and chart material show relation to growth and well being of food materials found in fruits and vegetables.

- 11-16. Food preservation.

Food Preservation—Topics of interest and value are:

- I. Some causes of deterioration in food. Microorganisms studied from these viewpoints:

The work in food preservation supplies a number of household bacteriology project possibilities.

| Topics | Subject Matter and Procedure  | Home Activities  | Remarks  |
|--------|---|--|--|
|        | <p>a. Comparative resistance of different groups.</p> <p>b. Conditions favorable for growth.</p>  |  |  |
| II.    | <p>Ways of keeping fruits and vegetables for winter use:</p> <ol style="list-style-type: none"> <li>1. Canning — different procedures used, selecting for each procedure a fruit or a vegetable especially well suited to that method.</li> <li>2. Drying. If available dry sweet corn—that to be compared with the canned product, later in the term.</li> </ol> |  |  |
|        | 3. Storage of vegetables.   |  |  |
|        | <ol style="list-style-type: none"> <li>a. In a cellar where conditions are desirable.</li> <li>b. In the ground by proper methods. Group vegetables according to methods best suited. Actually carry over into winter storage eight or ten varieties—these to be used in meal preparation work.</li> </ol>  | <p>Where possible, carry into winter storage vegetables to be later used in lessons in meal service. Home projects from which individual students may choose are:</p> <ol style="list-style-type: none"> <li>1. Converting the boys and men of the family to the salad habit.</li> <li>2. Learning to eat vegetables through preparing in especially palatable and attractive ways.</li> </ol> | <p>In the lessons on vegetable cookery if there is interest in securing a product that is both palatable and attractive—and if care is given to seasoning and attractive service—these lessons can be made extremely and deservedly popular.</p> |
|        | III. Fruit jellies. These products will be tested in the meal service class of the latter part of semester.   |  |  |

1. Discuss principles vs. receipts or recipes (Goldthwaite).
2. Essential constituents.
3. Procedure in jelly-making.
4. Score card.
5. Canning juices for fruit-jellies to be made later.
6. Preparation of jellies.

#### 17-22. Vegetable Cookery.

Vegetable cookery—Topics to follow set forth the particular points to be stressed in this series of six lessons.

- I. Groups of nutrients to be considered in vegetable cookery and properties of these nutrients to be taken into account.

1. Vitamins.
2. Mineral nutrients.
3. Sugar.

#### II. Aims in vegetable cookery.

1. To make palatable through
  - a. Conserving to fullest degree substances that contribute to flavor.
  - b. Removal of some of strong flavor that might interfere with desirably liberal use.

| Topics | Subject Matter and Procedure   | Home Activities | Remarks |
|--------|--|-----------------|---------|
|        | <p>2. To preserve attractive appearance through retention of color and attractive service.</p> <p>3. To give food value through preventing unnecessary removal of soluble nutrients, or destruction by heat and other agencies.</p>  |                 |         |
|        | <p>III. Methods of cooking different types of vegetables to be determined by value of values most to be conserved if they are to be eaten as much as is desirable, i. e., if the saving of palatability is at some expense to food value then sacrifice the latter.</p> <p>1. Baking—Applicable where structure permits. Potato, squash.</p> <p>2. Steaming—Directions for good practice to be specifically given. Vegetables preferably steamed: sweet potatoes, carrots, beets, parsnips.</p> <p>3. Boiling (in open kettle) cabbage, turnips, onions.</p> |                 |         |
|        | <p>IV. Methods of saving nutrients that are dissolved in cooking.</p>  |                 |         |

V. Potato cookery, given special attention because so stable a food and extensively produced in the state.

VI. Salads and easily made dressings. Importance of salad habit. Review points presented under earlier discussions as to importance of raw fruits and vegetables in diet, in second lesson and in lessons 10-15.

Summary of nutrition facts and food preparation methods covered to date. Written lesson.

## 23. Review.

24-36 Protein foods  
—Milk, eggs,  
flesh foods, legumes.

1. Composition—study of outstanding characteristics that account for the place of proteins among food constituents.

1. Characterizing element found in protein foods.

2. Elementary discussion of variations in building blocks that account for differences in values among protein foods.

3. Groups of foods rich in "complete proteins".

4. Groups of foods characterized by "incomplete proteins".

From the home projects listed, choice may be made by student to suit the convenience and need of the individual home.

1. Comparative studies in methods of making cottage cheese. Devise practical ways of bringing about more general use of cottage cheese.

In laboratory work with white sauces caution against misuse of cream sauce dressings. An illustration of misuse is the creaming of peas and the vegetables that are far more delicious and attractive with addition of seasoning and butter only. In view of the fact that 90% of the Colorado bean crop is of the Pinto bean variety, it is especially to be desired that particular product be used both in experimental work and in meal service.

| Topics | Subject Matter and Procedure   | Home Activities  | Remarks  |
|--------|--|--|--|
|        | <p>5. Review early lessons on food selection. Accepting the conclusion that about 10% of the total calories should come from protein foods, list amounts that will satisfy body needs.</p> <p>II. Groups of protein foods to be studied and topics to be emphasized.</p> <p>1. Milk and cheese.</p> <p>a. Composition and explanation of outstanding values of milk as food.</p> <p>b. Uses of milk in cookery demonstrated by the preparation of junket and white sauces, cream soups.</p> <p>c. Cottage cheese.</p> <p>d. Uses of other types of cheese in food combination.</p> |  |  |
|        | <p>2. Eggs.</p> <p>a. Value of eggs as food.</p> <p>b. Properties to be taken into account.</p> <p>1. Elasticity and viscosity by which air is enclosed.</p> <p>2. Coagulability.</p>  | <p>2. So far as material is available—assemble data bearing on methods of preserving eggs and if possible test out preserved eggs against the fresh product.</p> | <p>This recommendation to the teacher is especially pertinent not only as it applies to legumes but potatoes, apples, head lettuce and all other horticultural and vegetable products that are produced in commercial quantities in the state.</p> |



- c. Cookery work to include the preparation of:
  1. Egg alone.
  2. Egg—milk mixtures, custards.
  3. Souffles, omelets.
  4. Sponge cake (given later).
  - d. Preservation of eggs to be used later.
3. Flesh foods.
  - a. Meat and poultry. Refer to text books.
  - b. Fish and shell fish.
  4. Soups with stock. Structure, relative composition and cooking temperature. Current practice of skimming away the nutritive part of meats soups should be corrected and direction in text books disregarded.
5. Legumes.
  - a. Food value as compared with other types of protein food listed above.
  - b. Procedure in cooking various types of legumes.
6. Protein and fat combinations. Students will welcome here lessons on
  3. A report on first hand experience in giving material on cutting up meat, render lard, etc., in quantity where farm home opportunity is afforded.
  4. Making salads with oil dressings acceptable to the family as a whole.

Note incompleteness of bean proteins.

| Topics                               | Subject Matter and Procedure   | Home Activities | Remarks |
|--------------------------------------|--|-----------------|---------|
|                                      | the salad dressings that are of the heavy emulsion type—varieties of mayonnaise dressings. Through the oil dressing there is a means of introduction into the diet more fat, of which our many underweight people require more than they frequently can get from butter and cream sources.   |                 |         |
| 36. Review.                          | Summarize the deductions from study of protein foods.  |                 |         |
| 37-39. Carbohydrates types of foods. | Carbohydrates grouped according to sugars, starches and cellulose enable the teacher to present the work in a way better used by high school girls.  |                 |         |
| 1. Starches.                         |  |                 |         |
| 2. Rice.                             |  |                 |         |
| 3. Cereals.                          |  |                 |         |
| 4. Flour Mixtures.                   | <ol style="list-style-type: none"> <li>1. Starch.               <ol style="list-style-type: none"> <li>a. Food value. Place in diet.</li> <li>b. Experiments to show different methods of combining starch with liquid in cookery.</li> <li>c. Comparison in thickening power of starch from various sources, i. e., potato, corn, wheat, rice, etc. Point to practical applications of each type of starch.</li> <li>d. Review white sauce work of earlier lesson.</li> </ol> </li> </ol> |                 |         |

## 2. Rice—a starch rich food.

- a. Composition. Food value. Respects in which rice is not an acceptable potato substitute.
- b. Cooking methods used in cooking of rice for both main-dish and dessert uses.

## 3. Breakfast cereals.

- a. Composition in general. Importance of the use of "whole" cereal (negligible differences between cereals).
- b. Cooking methods, proportions, and, time table tabulated. Apply in cooking distinctly different types.

## Flour Mixtures

Outline contains topics meriting emphasis.

1. Study of various types of flours as to color, feel, appearance and relative looseness. Later in the series of lessons decide on circumstances under which the use of pastry flour is warranted.

Especially with flour mixtures it is extremely desirable to carry on accompanying home projects some of which are suggested:

1. The Saturday baking for one month.
2. Baking for the Woman's Exchange.
3. Baking in large quantity for some special event.

In all flour mixture work, after student has prepared each type in small quantity—that test of the method should be followed by actual preparation in large amounts. Where there is a school lunch room, arrangement may be made with the one in charge to take over the full-size loaves of bread, the pan of rolls or the

| Topics | Subject Matter and Procedure  | Home Activities | Remarks   |
|--------|---|-----------------|---|
|        | 2. Leavening agents. Conditions under which one gets best results with use of each type.  |                 | cake as the case may be. The teacher in charge will insure classroom success in this difficult phase of food preparation work to the degree to which she herself can do. She must not alone be able to theorize and tell of the "how", she must be able to execute. |
|        | 3. Classification of flour mixtures on basis of relation of flour to liquid. <ol style="list-style-type: none"> <li>Pour batter.</li> <li>Drop batter.</li> <li>Soft doughs.</li> <li>Stiff doughs.</li> </ol>  |                 |   |
|        | 4. Study of some purposes served by each of the various ingredients.  |                 |   |
|        | 5. Study of how basic recipes are formulated. Modify a basic recipe for muffins, through addition of a little more shortening and sugar, and a little flavoring. Modify that simple cake by changes in the form of flavoring, substituting, spice, chocolate or other flavoring material. |                 |   |
|        | 6. Score cards. Study of score cards preliminary to intensive preparation of flour mixture.   |                 |   |

7. Flour mixture products to be prepared.

### Pour Batters

Pop overs.

Griddle cakes.

Waffle.

### Drop Batter

Muffins.

Simple cup cakes.

(Modification of muffins.)

Cakes with butter.

Sponge cakes (Yellow and White or Angel cake).

### Soft Doughs

Baking powder biscuits. Yeast breads (especially whole

short cake. wheat bread).

Doughnut.

Cookie.

Pastry—(Very little pastry work).

General rules.

Caution that pastry should not replace fresh fruit desserts in the meal planning.

Sugar Cookery.

Insure accurate tests for thread, soft ball, hard ball, and other stages.

Candy making.

Frozen desserts.

Making of candy for a candy sale.

54-56. Sugar Cookery.

57. Frozen desserts.

| Topics               | Subject Matter and Procedure   | Home Activities  | Remarks  |
|----------------------|--|--|--|
| 58. Review.          | Review of work on carbohydrates and flour mixtures and use margin of time for strengthening weak places in work.   |  |  |
| 59.                  |  |  |  |
| 60-85. Meal Service. | Meal Service.  |  |  |
|                      | I. Guiding rules to Meal Planning. Preparatory to meal service, in which the recently acquired food facts, the more critical judgment and the technical skills are put to use, there should be a bringing together of the important rules guiding selection and preparation of food. Meals served must be planned to meet the wide range of needs of the pre-school age child, of the girl herself, the older brothers, and of the elderly member of the family as well. | 1. The family marketing (where feasible) over limited period of time.<br>2. A week's supply of vegetables for the student's home. Check against the desirable minimum.<br>3. How to meet the raw fruit and vegetable problem in a rural county.<br>4. Preparation of family meals over limited periods. The Sunday meals for a month. The management of the meal end of the housekeeping problem for a part of the holidays. | Where possible to establish close working relation between the mother and the school much of the valuable experience of the mother can be brought into the class room. Some very worth while findings of the classroom can be translated to the home.<br><br>In the meal service work the planning, preparation, serving and summary for each meal will occupy the class time for not less than three days. It is then apparent that home practice work should accompany the class work. |
|                      | II. Score card for judging meals. In use of score card for judging meals set off against a poorly chosen meal observed in some public dining place. Adapt score card, if necessary, to possible conditions.  |  |  |
|                      | III. Selection of Food and Marketing Problems.   |  |  |



- IV. Preparation.  
Students to work in small groups preparing family size quantities.
- V. So far as possible, include in meal plan a part, at least, of the fruits and vegetables, dried and stored in fall. Qualified by simplicity and quality.
- VI. Prevailing spirit.  
Individual responsibility for the wholesome spirit of the group at table.
- VII. Consideration of miscellaneous problems that will arise as
  - a. The eating between meals.
  - b. The prohibitions imposed upon the very small child.
- VIII. Fundamentals of rules for conduct at table. Evolution of manners.
- IX. Hospitality.  
The significant elements of hospitality.
- X. Infant feeding problems. Facts that should be current knowledge. See

| Topics             | Subject Matter and Procedure  | Home Activities | Remarks |
|--------------------|---|-----------------|---------|
|                    | bulletins issued by Children's Bureau at Washington, D. C.  |                 |         |
|                    | XI. Housewifery problems connected with meal service.<br>Care of dining room furnishings, etc.                                  |                 |         |
| The Health Report. | The Health Record Project.<br>Check on health record undertaken at the beginning of the semester.<br>Add supplementary reports. |                 |         |

### III. Bibliography

The teacher who has majored in home economics in her college course is qualified to use technical bulletins from the U. S. Department of Agriculture, Experiment Stations and other institutions. The State Experiment Station of Colorado has published some very usable bulletins. Original articles occurring the Journal of Home Economics, Hygeia and corresponding periodicals will likewise supply valuable text material. The teacher of more limited training will doubtless find it necessary to choose a text from among those named in connection with the Foods course in the Junior High School.

#### REFERENCE BOOKS

##### Dietetics for High

|  |                          |                        |        |
|--|--------------------------|------------------------|--------|
| Schools .....                              | Willard and Gillette.... | Macmillan .....        | \$1.50 |
| Feeding the Family....                     | Rose .....               | Macmillan .....        | 2.00   |
| Human Physiology....                       | Stiles .....             | W. B. Saunders...      | 2.00   |
| Nutritional Physiology..                   | Stiles .....             | W. B. Saunders...      | 2.00   |
| Everybody's Cookbook..                     | Lord .....               | Henry Holt Co....      | 5.00   |
| Butterick Cookbook....                     | Rose .....               | Butterick Pub. Co..    | 2.50   |
| Successful Canning and<br>Preserving ..... | Powell .....             | Lippincott .....       | 250    |
| Measurements for the<br>Household .....    | Circular No. 55.....     | Bureau of Standards... |        |

#### ADVANCED CLOTHING

Eleventh Grade. Elective. Double period daily, second semester.

##### I. Objectives:

1. To develop judgment in the choice of color, line, and fabric and workmanship in dress.
2. To choose dress suitable to the individual, the use, the income, the climate.
3. To encourage economy by conservative buying.
4. To give the girl some experience in correct handling of dress fabrics.
5. To choose or make suitable dress accessories.
6. To point out responsibility for one's personal appearance.

## II. Outline of Course in Advanced Clothing

| Time      | Topics   | Details  |
|-----------|--|--|
| 1 lesson  | Value of clothing.   | <ol style="list-style-type: none"> <li>1. Legitimate use:               <ol style="list-style-type: none"> <li>a. for warmth.</li> <li>b. for protection.</li> <li>c. for beauty.</li> <li>d. for modesty.</li> </ol> </li> <li>2. Confusing use:               <ol style="list-style-type: none"> <li>a. display.</li> <li>b. fashion.</li> <li>c. indicate wealth.</li> <li>d. social position.</li> <li>e sex attraction.</li> </ol> </li> </ol>  |
| 1 lesson  | Kinds of clothing.   | <ol style="list-style-type: none"> <li>1. Customary for:               <ol style="list-style-type: none"> <li>a. Adults.</li> <li>b. Maternity.</li> <li>c. Infants.</li> <li>d. Small children.</li> <li>e. Adolescents.</li> <li>f. Old age.</li> </ol> </li> </ol>  |
| 1 lesson  | Amount of clothing.  | <ol style="list-style-type: none"> <li>1 Depends on:               <ol style="list-style-type: none"> <li>a. Occupation.</li> <li>b. Frequency of laundering.</li> <li>c Storage space.</li> <li>d. Funds available.</li> <li>e. Good management.</li> </ol> </li> </ol>   |
| 3 lessons | Choice of clothing.  | <p>Depends on:</p> <ol style="list-style-type: none"> <li>1. Individual (here a high school girl is one chosen).               <ol style="list-style-type: none"> <li>a. Suitable                   <ol style="list-style-type: none"> <li>1. as to cost.</li> <li>2. as to fabric.</li> <li>3. as to line or make.</li> <li>4. as to use or occupation.</li> <li>5. as to season or climate.</li> <li>6. as to type (blonde—large or small).</li> <li>7. as to age or activity.</li> <li>8. as to occasion.</li> <li>9. as to temperament.</li> </ol> </li> </ol> </li> </ol> |
| 2 lessons | <p>Choice of color.</p> <p>Note: Use of colored cotton crepes above face to determine becoming colors.</p> <p>Use of color charts.</p> | <p>Depends on:</p> <ol style="list-style-type: none"> <li>1. Season.</li> <li>2. Use.</li> <li>3. Coloring of person.</li> <li>4. Vivacity.</li> <li>5. Occupation.</li> <li>6. Sometimes on age.</li> </ol>   |

| Time           | Topics  | Details   |
|----------------|---|---|
| 1 lesson       | Choice of fabric (at this time a pretty wool challie or a linene is advised).<br>Note: Samples displayed or shopping trip made. | Influenced by:<br>1. Money on hand.<br>2. Season.<br>3. Use.<br>4. Preference.<br>5. Service.<br>6. Fashion.<br>7. Ease of handling.<br>8. Effect when made.  |
| 1 lesson       | Choice of a pattern or of type of dress (when buying ready made).   | Depends on:<br>1. Individual type.<br>2. Use.<br>3. Upkeep.<br>4. Sentiment.<br>5. Fashion.   |
| 1 or 2 lessons | Choice of accessories.<br>Design of accessories (as collars, handkerchiefs, scarfs, beads, purse, parasol, etc.).               | To suit:<br>1. Dress.<br>2. The person.<br>3. The purse.<br>4. The use.<br>5. Fashion.  |
| 1 lesson       | Choice of a hat. (Display of shapes to try on.)   | Depends on:<br>1. Use.<br>2. Costume.<br>3. Wearer, becoming to.<br>4. Cost.<br>5. Length of service expected.  |
| 3 lessons      | Alteration of old hats or changes in bought shapes.   | Purpose—Effect:<br>1. Suit the individual:<br>a. By reducing height, if necessary.<br>b. By increasing height if desirable.<br>c. By reducing such lines as<br>1. too round face.<br>2. a long narrow face.<br>3. high cheek bones. |
| 5 lessons      | Covering shapes and lining hat.   | 1. Measurements:<br>a. Crown.<br>b. Brim.<br>2. Use of biases on brims.<br>3. Covering crowns.<br>4. Linings.   |
| 1 lesson       | Trimmings.  | 1. Plaitings of ribbons.<br>2. Bows.<br>3. Simple flowers of silk.<br>4. Folds.<br>5. Applied braids.<br>6. Sewing on any trimmings.  |

| Time       | Topics   | Details  |
|------------|--|--|
| 12 lessons | Making the dress (fabric if chosen as indicated above and hat made to accord. Will insure unity in dress). | Steps:<br>1. Testing pattern.<br>2. Cutting dress.<br>3. Pinning and basting seams.<br>4. Fitting and altering where necessary.<br>5. Re-basting.<br>6. Stitching.<br>7. Finishing seams.<br>8. Cutting bias binding or facing.<br>9. Adjusting, facing and stitching.<br>10. Finding hem.<br>11. Making hem.<br>12. Pressing. |

A test should be given after each 12 lessons.

### III. Bibliography

| Author         | Title                                    | Publisher                      | Price  |
|----------------|--|--------------------------------|--------|
| Dyers, D. E... | Textile Fabrics.....                     | Houghton Mifflin.....          | \$1.75 |
| Woolman .....  | Choice, Cost, and Care of Clothing ..... | Whitcomb Barrows, Boston ..... | 3.00   |

#### References

|                      |   |                                     |      |
|----------------------|---|-------------------------------------|------|
| Denney .....         | Textiles and How to Know Them .....     | Lippincott .....                    | 1.50 |
| Fales, Jane...       | Dressmaking and Textiles...             | Scribners .....                     | 2.00 |
| Baldt, Laura..       | Clothing for Women—Steps in Sewing..... | Lippincott .....                    | 2.00 |
| Cook, R.....         | Sewing Machines.....                    | Manual Arts Press, Peoria, Ill..... | 1.25 |
| Cook, R.....         | Essentials of Sewing.....               | Manual Arts Press, Peoria, Ill..... | 1.40 |
| Kinne & Cooley ..... | Shelter and Clothing.....               | Macmillan .....                     | 1.10 |
| Turner, A....        | Sewing and Textiles.....                | Appleton .....                      | 1.75 |

#### Bulletins

|  |                                 |
|--|---------------------------------|
| N. Gleason—Bulletin 29, How to Buy, Care for and Use the Family Wardrobe ..... | Denton, Texas                   |
| Circular 113—Making Clothes Last Longer.....                                   | Wisconsin University            |
| Fashion—Its Use and Abuse.....   | University of Illinois Bulletin |
| Clothing Thrift—No. 51, Ames, Iowa, State Agricultural College Bulletin        |                                 |



**THE HOME**

Twelfth Grade. Elective. One Unit

Daily throughout the year.

**Objectives:**

1. To lead the student to consider some of the basic problems of shelter and social relationships within the home and outside the home.
2. To help the students to set up ideals in relation to home life.
3. To emphasize the need for us to play the game on fair lines.

## II. Outline of the Course in The Home

| Topic                                  | Subject Matter and Procedure   | Home Activities  | Remarks   |
|--|--|--|---|
| Home.                                  | Definition. Ideals described. Free discussion. House versus home. Homes, humble and rich.  | Justification of a home as echoes are brought from home observations and reflections.                | Definition of home as brought by pupils posted on bulletin board.                         |
| The home owned versus the home rented. | A debate. Development of citizens. Economic problems. Social problem.  | Reaction of parents arguments brought forward in the home.   | Observation of students in the community noted. Photographs of both types of homes shown. |
| Care of rented property.               | Usual practices. Ideal practices. Evidences that landlord fear damage from children. Education for golden rule.  | What can you do to help keep up the rented property. Some people live a life time in a rented house. | Questionnaire posted.   |
| The home built versus the home bought. | Local problems of materials, labor, zoning, utilities, etc. Final cost. Hazards and conveniences.  | The parents viewpoint sought.  | Articles on cost posted. Pictures of such public menaces as stable, etc.                  |
| Consideration in choice.               | Locality as it relates to health, convenience outlook, social life. Cost related to incomes, upkeep, investment. Size and arrangement as affect family life. | Sketch own home and make possible improvement.   | Display of convenient house plans. Display of correct spacing on lot.                     |
| Standards of housing.                  | European. American. Local.   | How far the home fulfills the American standards.  | Floor plans and lot plans that fulfill these standards.                                   |

# Shortage of suitable houses.

Means of supplying houses.

1. Private enterprise.
2. Philanthropic.
3. Limited dividends.
4. Co-operative.
5. Co-partnership.
6. State of U. S. government.
7. Employers' houses.

## Housing laws.

State as New York.  
Municipal codes.  
Local, constructive, restrictive.

Telephone list of authorities on housing in this locality. Old citizens included.

Post assignments on these topics.

## Housing.

Maintenance, inspection, certification, licenses to rent.

Names and business offices of Possible defects in houses inspectors determined. Local laws on upkeep of premises.

## Community Sanitation.

High standards for public utilities. Public nuisances as banks, ditches, filth. Precautions as to water, food and milk supplies.

Find out at home or in city Requisites of idea street and hall the care taken of such public parks. questions. Results noted.

## House Sanitation.

Ideals within the reach of moderate.

1. Plumbing—safe.
2. Light and air—ample.
3. Waste disposal—prompt.
4. Weeds and trash—eliminated.
5. Drainage—careful.

Verification of these facts at home. Types of modern plumbing shown in cuts or books. Assignments on sewage, garbage, etc.

| Topic                                 | Subject Matter and Procedure   | Home Activities  | Remarks  |
|---------------------------------------|--|--|--|
| Home conveniences in house structure. | Relation of convenience to contentment and harmony.<br>Relation of convenience to well kept house. Steps saving—time saving. | Causes of discord often trivial. Examples recalled or noted.   | Correct relative placing of large furniture.   |
| Evolution of the home or shelter.     | History of habitations of men in different climates and ages. Development of better homes through the ages.                  | Compare your home with any very primitive home, as that of Eskimo or cave dweller.                               | Post pictures of types of homes.   |
| Better home campaign.                 | History of movement. Literature available. Co-operation of all classes in getting results.                                   | List changes that would be made at little cost to make your home better.   | Show picture of "better homes" given in periodicals.                                 |
| Landscape work.                       | Possible improvements made by use of shrubs, trees, flowers, grass, floriculture.  | Collect seed and flower catalogs. Study ways to improve home, grounds, plants. Elimination of unsightly objects. | Sketches or pictures of attractive premises. Screens for ash pits, etc.              |
| Repair work.                          | Use of lumber and paint as in trellises, seats, window boxes, etc. Repair of fences.   | Note such needs.   | Pictures of transformations as in "Better Homes".                                    |
| Home and homes.                       | Private and institutional homes compared. Lists of "Homes" for various groups.   | Groups in your own home, as children, aged, or infirm. Pride in care of members.                                 | Articles sought various "homes" built by individual gifts or the state or societies. |
| House plans.                          | Your ideals put on paper. Criticism from standpoint of standards studied.  | Ideas suggested by close consideration of our home and neighbors' houses.  | Photographs of local houses. Floor plans collected from magazines and books.         |

|                             |  |  |   |
|-----------------------------|--|--|---|
| Neighbors.                  | In social part. Its educational part.  |  |   |
| The family.                 | What constitutes a family. Must they be related? Types of families.  | Compare own family as to numbers with the average family, i. e., parents and three dependent children. | Geographical magazine pictures of various nationality groups.                   |
| Contacts within the family. | Parents and children, brothers and sisters, grandparents, uncles, aunts. Questions as to delegated authority. History of relationship briefly studied. | System of organization now seen in most homes. Compared to Bible history of Abraham.                   | References to Bible and books.  |
| Parents' part.              | Provision of shelter and other necessities. Chance for development, sympathy. Protection against menaces. Love.  | Causes that prevent this provision—misfortune, ill health, etc.  |   |
| Children's part.            | Co-operation, loyalty, deference, respect, industry, frankness, good cheer.  | The marks of an ideal home—one we always turn back to.   | Home Sweet Home, The Old Oaken Bucket. Sentiment association emphasized.        |
| Community's part.           | Churches, schools, museums, parks, concerts, libraries, general utilities as water, light, etc., transportation.                                       | How does the family help make those possible. Some results in social contacts.                         | Plans of good schools. Playground plans. List the recreation available locally. |
| Good Citizens.              | Qualities. Education for. What law-abiding means. The spirit of the law obeyed. Lives of great men and women used as illustrations.                    | Family government—the way citizens are trained. Fair play the key note.                                |   |
| Social Betterment.          | Various organizations and what they contribute to social betterment.   | Chart's to which members of the family belong. Their object and benefit.                               | Red Cross and other periodicals posted.   |

| Topic   | Subject Matter and Procedure  | Home Activities   | Remarks                                       |
|---|---|---|---|
| Social function of homes.                     | Development of judgment, unselfishness, and right standards of conduct.                             | Part the child can take in home life. Note possible contributions.                        |   |
| Educational function of homes.                | Team work. Increase of helpfulness and sympathy. Physical and mental. Problems solved.              | Child reports his idea of what home contributes to his education.                         |   |
| Economic function of homes.                   | Place value given many necessities. Consumption. Saving co-operation.                               | Consumption. Satisfaction had at home that money couldn't buy.                            |   |
| Biological function of homes.                 | Perpetuation of the race. Shelter of helpless young. Care of family through growth and development. | Man and animals alike look for proper shelter and for young and feed them and train them. |   |
| The standard American family.                 | What it has to live on. Get local facts. Use statistics from governmental reports or texts.         |   | Consult people at home as to average incomes. |
| Contrast present family with Colonial family. | As to members, occupation, amusements, education, co-operation, production.                         | Family reminiscences and books on Colonial life. Compare parent's ideas and own.          |   |
| Contrast city and country life.               | As to daily routine, amusements, educational opportunities, independence.                           | Do any of your family know facts on country life? Do you?                                 |   |
| Family finances.                              | Different income groups. Distribution varies. Typical budget given. Satisfaction secured.           | Among relatives and friends—income vary. Do all spend equally on the same things?         |   |
| Who earns the income.                         | Sources all considered such as salary, interest, gifts—the time spent in unpaid service.            | Does mother earn by work done for family? How can you tell?                               |   |
| Servants in the home.                         | Treatment, system, wages, living expenses.  | If the family do the work, how compute the value.   |   |



Guests in the home.

Hospitality. Courtesy. Contacts for education purposes. Observation for children. Kindness, unselfishness. The best place is given the guest. Pride in home is the moving spirit. Note courtesies shown a guest at home.

Happiness.

By-product of work. Pleasures contrasted. Not a goal to seek for itself. Place and money not essential. Point of view important. Home made the happiest place on earth. Home-ly pleasure leaves no bad taste.

Success.

What is success. Definitions. Is wealth getting success? Varying ideas and ideals. Point of view of those at home on such topics.

Happiness and success dependent on health.

Health and heredity. Health and environment. Health and habits. Assigned readings to be written up.

Health and food.

Choice of food. Temperance in eating. Tigue and eating. Hurry and eating. Note: Varying attitudes at home. Does mother eat when warm and tired?

Health and clothes.

Choice, care of bodily habits. System and order. Bodily care. Does mother have to see to all the clothes and body care of family? Is it right?

Shelter and health.

Light, heat and good air necessary. Relief from noises, privacy, rest, sleep. Kinds of windows. Adjacent. Nuisances as smoke stacks, stables, garages.

Health and play.

"All work and no play makes Jack a dull boy." Playground in cities. Some children have not places to play. Why play? Cats play with their kittens. Why?

Art and the home.

Effect of color in individuals. Color harmonies as found in interiors. To be had even by the people of moderate means. Curative effect of pleasing colors of walls. Irritating colors. Exciting colors. Advertisement colors. Clash of colors.

| Topic                | Subject Matter and Procedure  | Home Activities   |
|----------------------|---|---|
| Music and the home.  | Musical talent. Musical instruments—Victrola, radio, vocal music.   | Should talented children be educated by the state or should help be given the parents. Present knowledge of good music.                                 |
| Harmony in dress.    | Becoming, suitable clothes a big asset in creating contentment and home atmosphere. Influence of well dressed people. | Dignity in clothes. Disorderly conduct and clothes. Ill fitting clothes and temper.   |
| Tolerance.           | Critical people. Harsh criticisms. Unsympathetic voice. Sarcasm—avoid.  | Shakespeare says, "Beware of entrance to a quarrel". Faith creates a desire to merit the praise given.  |
| Beauty and health.   | Sordid surroundings affect health. Slums. Living in a junk shop would be disturbing.                                  | Back yards sometimes reflect mental states in family life. A cluttered house is a poor training ground for commercial success of business organization. |
| Fire protection.     | Menaces and how met by laws. Emergencies. Dangers to children. Precautions in home life.                              | Home experiences.   |
| Accidents.           | How to meet the unusual, the unexpected. First aid. Common accidents. Home remedies.                                  | How some have been met in your own home. Keeping a level head.  |
| Minor illnesses.     | Preparation for these. Knowledge necessary. Sick people's trays. Care of bed room.                                    | What mother does in such cases.   |
| Pre-school children. | Social instincts. Imagination, memory, habits, play, food, dress, sleep.  | Justification of home life is the child. It is the chief interest of the home.  |
| Child care.          | Care of—training of. Child welfare work.  |   |

|                         |   |  |
|-------------------------|---|--|
| Reading.                | Books suitable for different ages. Literature that will benefit development.  |  |
| Magazines, papers.      | The local paper. Current magazines. Why they are read.  | Educational value of current news. Informational value.  |
| Writing.                | One learns to do well something they desire to do, and learn the fundamentals early, so writing is learned.   | Family stories. Tradition in families.   |
| Story telling, a hobby. | A gift—famous stories, acquired, told. A vocation necessary. An avocation desirable. The joy of doing something that appeals to you alone. Educational value. |  |
| Judgment.               | Development by having some choice. Helped by children's allowances. By projects worked out by children.   | Dietation of choice by parents is a policy that belongs to a past regimen. Brought out at parent-teacher meetings.   |
| Standards of living.    | High—low. For show. For service. For love. Imitative. Social climbing.  | Are one's home ideas copies from more prosperous neighbors or relatives.   |
| Dangers of debt.        | Credit systems. Cash systems. Living beyond one's means.  | Value of deferred payments. Value of cash. False standards.  |
| Investments.            | A home. Life insurance, education, building loan, U. S. bonds, municipal bonds, mortgages.  | Does it pay to buy a home? Bring reaction from home on all these questions.  |
| Children's allowances.  | Educative. First to pay for extras. Gradually increasing the responsibility till a child can be trusted to manage school money.                               | Some advise at first helping draw conclusions. For example—if a child spent a week's allowance in a day, he must surer the consequences or the lesson is lost. |
|                         | A test to be given after each twelve lessons is completed.  |  |

### III. Bibliography

|  |        |
|--|--------|
| Abel—Successful Family Life on a Moderate Income, Lippincott.... | \$2.00 |
| Wood—Housing the Low Paid Wage Earner.....                       | ...    |
| Veiller—Model Housing Law, Sage.....                             | 4.00   |
| Robertson, J.—Housing for the Public Health, Funk.....           | 1.50   |

#### *Bulletins from National Housing Association, N. Y.—*

|  |      |
|--|------|
| Prang—How to Enjoy Pictures, Holt.....                               | 1.50 |
| Oliver, M.—First Steps in the Enjoyment of Pictures, Holt.....       | 1.50 |
| Autcliffe—How to Enjoy Music, Dutton.....                            | 2.00 |
| Smith, C. A.—What Can Literature Do for Me.....                      | 1.00 |
| Lyman, E.—Story Telling, McClung.....                                | 1.25 |
| Robinson, L. E.—Domestic Architecture, Macmillan.....                | 2.40 |
| House Beautiful Magazine, 8 Arlington Street, Boston.....            | 3.00 |
| House and Garden, Conde Best & Co., 19 W. 44th Street, New York..    | 3.00 |
| Bulletins on Garden and Home Grounds, T. D. Graw, West Va. Univ. ... | ...  |
| Greta Gray—House and Home, Lippincott.....                           | 3.00 |
| Gridland, R. B.—Practical Landscape Gardening, De La Mare... ..      | ...  |
| American Homes, 53 Jackson Blvd., Chicago.....                       | 1.00 |

### PROFESSIONAL PROBLEMS

Teachers are urged to address the Departments of Home Economics at the several state institutions when in need of further information regarding the material outlined in the state course of study. Locations are given herewith:

The State Teachers College, Greeley, Colorado.

The State Agricultural College, Fort Collins, Colorado.

The State University, Boulder, Colorado.

Western State College of Colorado, Gunnison, Colorado.

Rather current professional mistakes that call for correction are these: the acceptance of home economics positions by teachers untrained in this specific field; the assignment of indifferent students to home economics classes, and, the exploitation of home economics classes. The untrained teacher who has inadvertently been presented with a position for which she has not adequate preparation, should, out of respect for herself, and home economics, at the earliest possible opportunity, enter upon intensive training that will prepare her for honest effective work. The teacher in this subject has further need to give and to demand an intellectual standard that is not below that held for mathematics, Latin, chemistry and other older established subjects. There is a tendency to delegate responsibility for the conduct of the school lunch to the class in home economics. As usually car-

ried on this is pedagogically unsound procedure, for the lunch room work necessitates much of routine. A quotation from Dewey points to the fallacy: "To keep on growing one must meet new problems, learn new things, thus developing the powers of reasoning and judgment. Any manual labor ceases to be educative the moment it becomes thoroughly familiar and automatic."

### The Lesson Plan

The outline for planning a daily lesson has been adapted from that used at the Colorado State Teachers College.

The Lesson Plan:

- A. Statement of what you will teach each day. Be specific, differentiate all other lessons.
- B. What is the function of today's work.
  - a. As a step in the teaching of the whole unit?
  - b. Aside from this relation, has it any special value?
- C. What books or other material will be needed? Which are for your use which are for the use of the children?

### Lesson Plan

State this as you would expect to say it in your class.

#### I. Introduction:

How will you introduce this lesson so that your class will:

1. Feel the need of it?
2. Be interested in it?
3. Have the proper mind set for it?

#### II. Problem.

How will you guide the pupils in each day's problem so that:

1. It will be understood by them?
2. It will arouse their interest and desire to work it?
3. It will cover your aim as stated in "A" and "B" above?
4. It will form the center for your entire lesson?

#### III. Methods:

1. What are the main steps in the solution of the problem which is before the class? (The chief points of appreciation in case the lesson is chiefly for appreciation).



2. a. In case there is a study period what should be accomplished in this study period?
- b. How will you conduct your study period so that:
  - (1) Your assignment will be clearly stated and will guide the study?
  - (2) The study period will be properly supervised?
  - (3) The children will have the major part in the discussion which follows the study period?

#### IV. Conclusion:

After the pupils have completed the solution of their problem or after they have had the opportunity to appreciate the experience of which this unit of subject matter consists, how will the experience just gone thru be perfected so that:

- a. It may be remembered?
- b. It may receive the best organization for future use?
- c. You may be sure they know the important points covered in each day's lessons?

### Tests and Measurements

In so new a subject as Home Economics tests are being evolved by which attainment can be measured. Especially helpful references are given below:

- 1—What Educational Measurements can do for Home Economics. Clara M. Brown. *H. H. Ec.*, April, 1924, V. 16:191.
- 2—Construction and use of Information Tests in Home Economics. *J. H. Ec.*, May, 1924, V. 16:251, Clara M. Brown.
- 3—The Murdoch Sewing Scale. Manual of Directions. By Katherine Murdoch. *Teachers College Bulletin*, 14th Series, No. 3. New York: Teachers College, Columbia University, 1923, 25c. Murdoch Analytic Sewing Scale for Measuring Stitches. Revised by Katherine Murdoch. New York: Bureau of Publications. Teachers College, Columbia University, 1923, 25c.
- 4—Standardized Tests in Textiles and Clothing. By Mabel B. Trilling and Florence Williams, University of Chicago, *Journal of Home Ec.*, 1920, 12:483-491.
- 5—Informal Tests in Teaching Textiles and Clothing. By Mabel B. Trilling and Adah Ross, University of Chicago, *J. of Home Ec.*, 1921, 13:483-488.



- 6—Investigations Concerning the Murdoch Sewing Scale. By Clara M. Brown. Teachers College Record, 1922, 34:459-470.
- 7—Home Economics Sewing Tests for Girls. By Anna M. Cooley and Grace Reeves. Teachers College Record, 1923, 24:374-392.
- 8—Chart for diagnosing Defects in Buttonholes. Issued by Bureau of Educational Measurements and Standards, State Normal School, Emporia, Kansas, 1922. 15c.
- 9—A Sewing Scale. Devised by Katherine Murdoch, Ph. D. of New York. Bureau of Publications, Teachers College, Columbia University, 1919, 16 sheets. \$1.50.
- 10—Fundamentals of Educational Measurement. By C. A. Gregory, University of Oregon, Appleton and Co., New York, 1923, pp. 382. \$2.25.
- 11—How to Measure Education. By W. A. McCall, Columbia University, New York. The Macmillan Co., 1922, pp. 416.
- 12—How Measurement of Higher Education. By B. D. Wood, Columbia University. New York, Yonkers on Hudson. World Book Co., 1923, pp. 337.
- 13—Written Examinations and Their Improvement. By Walter S. Monroe, University of Illinois. Bureau of Educational Research, 1922, pp. 71. 50c.



OUTLINE

OF

HISTORY



## HISTORY

### Fundamental Aims of Education:

Which should be kept in mind in teaching history.

1. Promotion of health and health habits.
2. Training for worthy use in leisure time.
3. Training for worthy home membership.
4. Training for good citizenship.
5. Training for the building of ethical character.
6. Training in the fundamental mental processes.
7. Training in vocational guidance.

### General Objectives:

1. To interpret the social and economic contacts of the pupil with his environment, i. e., the effect of geographic forces; relation of America to other nations.

2. To train pupils to think in terms of everyday life. As an aid to this, material studied should be grouped into problems, so that solving them means:

- a. Gathering, evaluating and selecting facts.
- b. Drawing conclusions from facts in given situations.
- c. Furnishing the background for a choice of vocation.

3. To acquire knowledge of, and an appreciation for the culture and achievements of other nations, so as to better understand our own.

4. To help to give the individual pupil the knowledge, interest, ideas, habits, and powers whereby he will find his place in society, and use the place to shape both himself and society to nobler ends.

5. To broaden the sympathies and lay a foundation for permanent and worthy refinement.

### Specific Aims to be Developed:

1. Historical vocabulary should be developed before any text book work is given. Drill should be given on such historical terms as follows:

- a. Parliaments—treaty—armistice.
- b. Dynasty—nationalism—truce—protocol.
- c. Political—social—economic—orthodox.
- d. Culture—civilization—secular.

- e. Diplomacy—alliance—imperialism—hegemony.
- f. Different forms of government.
- g. Coup d'etat—burghers.
- h. Plebiscite—nationalism.
- i. Insurrection—fusion.
- j. Bourgeoisie—excavations.
- k. Proletariat—rapprochement.
- l. Code—natural boundaries.
- m. Concessions—mandatory power.
- n. Covenant—peers—factions.
- o. Liberals and conservatives—arbitration.
- p. Social legislation.
- q. Nationalization.
- r. Racial.

### To Acquire:

2. Skill in using reference books, and in using the mechanical parts of a book; table of contents, index, maps, charts, foot notes.
3. To acquire some skill and much exactness in making charts, graphs, maps and outlines.
4. To develop habits of good English in oral and written work.
5. To learn to use and judge facts after learning them, and to develop some power in drawing conclusions.
6. To develop an ability to appreciate human institutions.
7. To secure an attitude of open-mindedness.
8. To educate the rising generation to a sense of world citizenship.
9. To gain ability to see place geography through seeing it as a field of human action, and as a background for human experience.
10. To see history as a continuity—a growth—a development.
11. To develop an interest in the reading and study of history, and biography.

### Methods:

1. Use laboratory plan if possible, working with either groups or individuals. Have as much studying as possible done under the direction of the teacher.
  - a. Use as many charts, magazines, pictures, lantern slides, and reference books as your community affords.



- b. Have the students work out projects, and let the recitation be the culmination of the group work.

(1) Three classes of projects may be used:

- (a) information project
- (b) the enjoyment project,
- (c) problems. The problems should be from effect to cause, or cause to effect in type. This will teach children *to form judgments, and to look behind facts for the motive*. They arouse self-activity to get thought from the printed page. They challenge the intellect. Life is a process of solving problems, and history should be taught in such a way that it be a training for this.

2. Debate if used judiciously will serve to develop thoughtful study.

3. Pageants and dramatization of all kinds will help to make history a reality, and give an excellent training in an understanding of manners and customs of the various peoples.

#### **Tests:**

Make all of this a part of educational measurement.

1. Essay type of test must not be entirely ignored as it is valuable for organization.

(a) A definite plan for each review should always precede a test, as the preparation for it, is the most valuable part of it. See that reliability, validity and objectivity, are characteristics of all tests.

#### **2. Objective Tests:**

A. Recall type:

- (1) Simply recall questions.
- (2) Completion exercises.

B. Recognition type:

- (1) Multiple response.
- (2) True—false.
- (3) Best answer.
- (4) Matching exercises.
- (5) Identification.

For further suggestion see:

McCall, W. A.: *How to Measure in Education*—Macmillan Co.

Wood, Ben D.: Measurement in Higher Education—World Book Co.

Ruch, G. M.: The Improvement of the Written Examination. Term Papers and Note-books.

All history students should keep note-books—large size preferable.

1. These should be systematically kept.
  - a. For outlines and problems forming basis of all assignments.
  - b. For outlines of any special reports.
  - c. For notes on *outside reading*.
    - (1) This should be done in connection with work on some assigned topic, or some problem. *Biography* should be used when possible.
  - d. For class notes.
  - e. Teacher should inspect from time to time to prevent careless work habits.
  - f. Books may have section used as scrap book for maps, pictures, graphs, etc., student may collect.
2. Only older students, juniors and seniors should write term papers.
  - a. Should be a longer piece of work for some training in application of historical method.
  - b. Affords training in making of bibliographies.
  - c. Affords opportunity in training in note taking—cords should always be used to insure proper organization. (See Seward, S. S. Jr. on note-taking).

### Supervised Study:

1. Work should be definitely and systematically assigned by the teacher.

2. Definite references should be made, so as to avoid waste of time; except when the exercise is to train in looking up references.

3. Give each student a list of suggestions on *How To Get a History or Social Science Lesson*:

4. Teacher should be sure students understand work to be done, and to standard to be obtained, as well as the material to be used.

5. Inspection of work every few minutes to determine,
  - a. Progress made.

- b. Difficulties.
- c. Method of study used.
- d. Material used.
- e. Effort put forth.
- f. Errors in method.
- g. Results obtained.

### Current Events

#### Objectives:

1. To make history concrete and real.
2. To make more direct personal appeal.
3. To study history in the making.
4. To study correlation of present with past.
5. To train in evaluation of printed matter.
6. To develop the habit of systematic reading in some standard magazine.

#### Method:

1. Give work definite place on program.
2. Vary work to suit needs and capacities of each class.
3. Use socialized recitation.
4. Class can be organized into committees effectively.

#### Magazine:

1. Criteria for judging fitness of periodical:
  - a. Use of precise and exact English.
  - b. Clearness of presentation.
  - c. Unquestioned reliability.
  - d. Lack of partisanship.
  - e. An aggressive policy for public good.
2. Weekly is preferable.

#### Difficulties to be Met:

1. Work may lack unity.
2. Danger of over-emphasis to Contemporary Events.
3. Incorrect interpretation of facts.
4. "Current Event Mindedness," a danger to be avoided.

## MEDIEVAL AND MODERN HISTORY

## Tenth Grade

**Growth of Civilization (800 to 1789):**

## A. Feudalism—Problem.

1. Rise, institutions, character.
2. Importance from military, financial, administrative, and social point of view.
3. Life in the country—Manor serfs.
4. Life in the towns.
  - a. Revival of towns, guilds, fairs, markets.
    - (1) Hanseatic League.
    - (2) Merchant Adventurers.
    - (3) Trade routes.

Read Webster's "General History of Commerce," Chap. V. and VI.—Chap. X. on Hanseatic League.

## 5. Decline of Feudalism.

- a. Growing power of Kings.
- b. Gunpowder.

**Germany—the Church and Italy in Middle Ages:**

## Problem:

The Church reaches and recedes from its influence as a temporal power.

## A. Conflicting theories and interests of Church and Empire.

## B. The Holy Roman Empire.

1. Influences on the power of Emperor.
2. Revival of Empire under Otto the Great (962).
  - a. Frederick I—Struggle with Popes.
  - b. The Lombard League.
3. Guelfs and Ghibellines.
4. Rise of Hapsburgs.
5. Feudal anarchy in Germany.

## C. The Church in the Middle Ages.

1. Organization of Church.
2. Church Courts—Excommunication and Interdict.
3. The Friars—St. Francis, St. Dominic.
4. Conflict with Civil Authorities.
  - a. Investiture—Canossa (1077).
  - b. Concordat of Worms (1122).
  - c. Quarrel with Henry II and Thomas of Becket.

- d. Relations of Innocent III with England, France and the Emperor.
- e. Taxation.
- f. Philip the Fair and Boniface VIII.
- 5. Debt Owed by Society to Medieval Church.
  - a. Charities—education—peace.
- D. Medieval Italy.
  - 1. Saracen and Norman in the South.
  - 2. Temporal power of the Papacy.
  - 3. City States in the North.

Problems:

Show how the Commercial Cities of the Middle Ages Developed.

What countries did the Holy Roman Empire embrace? Contrast it with England politically.

**The East and the Crusades:**

- A. The East Before the Crusades.
  - 1. Saracen Civilization in East and in Spain.
  - 2. The Coming of the Seljuk Turk.
- B. Crusades—Causes and Nature of Expeditions.
  - 1. The Religious Military Orders.
    - a. Templars, Hospitalers, and Teutonic Knights.
  - 2. Results—Commercial, industrial, religious, educational, growth of cities, municipal freedom, strengthening of monarchies.

Problems:

Show the effect of the Crusades upon Constantinople.

Develop the story of a medieval crusader, motives, vows, privileges, preparation, dress, arms, route, battle and sieges, benefits and disadvantages of the trip.

**France Under Absolute Monarchy:**

- A. Rise of Capetian Dynasty.
  - 1. Great fiefs of France (Normandy).
- B. Philip Augustus.
  - 1. Possessions of Henry II of England.
  - 2. Extension of royal domain.
- C. Philip the Fair: the States General 1302.

**D. The Hundred Years' War.**

1. Causes in France and Flanders.
2. Crecy and Poitiers.
  - a. Free companies and Brigandage.
  - b. The Jacquerie.
  - c. Agincourt.
  - d. Joan of Arc—Orleans.
  - e. Expulsion of English.

**E. Louis XI.**

1. Charles the Bold.
2. Centralization of power—Taille.

**England to 1485:**

English become one people.

**A. The Saxons (449-1066).**

1. Invasions.
2. Government and Life of Saxon England.
  - b. Alfred the Great and his problems.
  - c. The Danish Invasions.
3. The Norman Conquest and Its Results 1066.
  - a. Claims of William of Normandy.
  - b. Effects of Norman rule.
    - (1) Language, architecture, industry contact with continent.

**B. Constitutional Development:**

1. Organized Government:
  - a. Suppression of Barons.
  - b. Grand jury and trial jury.
  - c. Common Law.
  - d. Kings Court.
  - e. Magna Charta (1215).
    - (1) John and his quarrel with barons.
  - f. First Parliament 1265—Simon De Montat.
  - g. Model Parliament 1295—Edward I.

**C. Expansion—Conquest of Wales and Scotland.**

1. Bannockburn 1314.

**D. The Common People—Yeomen.**

1. Black Death and its effect.
  - a. Statute of Laborers.
  - b. Wat Tyler's Rebellion.



- E. Loss of Normandy—fusion into one people.
  - 1. Chaucer and The Canterbury Tales.
- F. War of the Roses—Effect upon Nobility.

### The Renaissance.

- A. Early or 14th century Renaissance.
  - 1. Gothic Architecture.
    - a. Cathedrals and public buildings.
      - (1) Rheims and Ypres.
  - 2. National literature in France, Italy, Germany and England.
    - a. Dante, Chaucer, the Troubadours, Nibelunglied.
  - 3. The fine Arts—painting—sculpture.
  - 4. Learning: Medieval universities.
    - a. Scholasticism—Roger Bacon.
- B. The Renaissance of the 14th and 15th Centuries.
  - 1. Political and Social conditions in Italy.
    - a. Florence and Venice.
    - b. The Papal Monarchy.
    - c. Rule of Despots.
  - 2. Renaissance begins in Italy.
    - a. Spirit and meaning.
    - b. Revival of learning.
      - (1) The Greek teachers.
      - (2) Work of Petrarch and Boccaccio.
      - (3) Humanists.
  - 3. Renaissance in Germany and England and France.
  - 4. Fine Arts during the Renaissance.
    - a. Great Architects.
    - b. Great Painters.
    - c. Great Sculptors.
  - 5. Discoveries and invention of Renaissance.
    - a. Portuguese discoveries to East.
    - b. Spanish discoveries in West.
    - c. French explorations.
    - d. Mechanical inventions.
    - e. New ideas in astronomy.
    - f. Art of printing.

Problem: Show how the Renaissance was a movement effecting all phases of life.

**Reformation and Period of Religious Wars.**

- A. General causes of Reformation.
  - 1. Renaissance and Humanists.
  - 2. Rise of National feeling.
- B. Political and Social conditions in upheaval.
- C. Spain consolidated into strong Monarchy.
  - 1. Expulsion of Moors.
  - 2. Union of Castile and Aragon.
  - 3. Growth of Royal Power.
- D. The Lutheran Church—Germany.
  - 1. Special causes for reformation in Germany.
  - 2. Luther, his doctrines—Theses—trial—edict of Normans 1122.
  - 3. Fanaticism and Civil War.
  - 4. Confession of Augsburg.
  - 5. Peace of Augsburg 1555.
- E. Calvinism in Switzerland, France, etc.
  - 1. Calvin, his policy and doctrines and educational ideas—Presbyterian.
  - 2. Servetus.
  - 3. Religious intolerance general.
  - 4. Huguenots in France.
    - a. Political, social and economic status.
    - b. Massacre of St. Bartholomew's Eve.
    - c. Henry IV and Edict of Nantes 1598.
  - 5. John Knox.
- F. Revolt of the Netherlands (1568-1648).
  - 1. Philip II and Discontent—Causes.
  - 2. Defeat of Armada; rise of Holland as a naval, commercial and colonial power.
- G. The Reformation in England.
  - 1. Henry VIII's Divorce Case.
  - 2. The Humanists—Erasmus—Colet—More.
  - 3. Change in Control rather than Doctrine.
  - 4. Radical changes under Edward VI—Reaction under Mary.
  - 5. Elizabeth and Protestantism.
    - a. National Independence.
    - b. Mary Queen of Scots.
    - c. Anglicanism and the 39 articles.

**H. The Thirty Years' War (1618-48).**

1. Causes—religion and political.
2. Peace of Westphalia (1648).
  - a. Terms and international importance.
3. Social and political effect upon Germany.

**I. Catholic Reformation—Jesuits.**

1. Loyola's character and organization.
2. Council of Trent 1545-63.
3. Reform in Discipline and Power.

Problem 1. Trace the development of England as a trading nation.

Problem 2. Show the services of the Jesuit missionaries in North America.

**England Under the Tudors (1485-1603).**

Under an intelligent despotism she emerges from her isolation.

**A. Henry VII.**

1. Effect on Country of War of Roses.
2. Court of Star Chamber—benevolences.
3. Policy of Peace—Trade with Continent.
4. "Great Intercourse."

**B. Henry VIII—his personal government.**

1. Wolsey and the Balance of Power.
2. Confiscation of Monasteries and New Nobility.

**C. Elizabeth.**

1. Political Attitude.
2. Trouble with Mary Queen of Scots.
3. War with Philip II of Spain—Armada.
4. Development of Nationalism.
5. Elizabethan Sea Dogs.
6. England's Position in World.

**D. Life in Tudor England.**

1. Trade—decay of guilds and rise of Middle Class.
  - a. Debasement and Restoration of Coinage.
  - b. Gain of Flemish trade.
  - c. Laws regulating trade.
  - d. Establishment of Navy.

2. Social and economic change.
  - a. Mode of living.
  - b. Enclosures—Rise of sheep industry.
  - c. Poverty and its causes—Poor laws.
3. Intellectual Awakening.
  - a. Growth of Spirit of adventure.
  - b. Establishment of schools and colleges.
  - c. Elizabethan literature.
    - (1) Drama and theatre.
    - (2) Shakespeare and Bacon.

### **The Puritan Revolution and Royalist Reaction (1603-88).**

Up to this time England had been a follower rather than a leader of Europe.

- A. Division between Stuart kings and parliament.
  1. Beginning of strife—change in national spirit.
  2. Personality of James I—Divine Right Theory.
  3. Increasing trouble under Charles I.
    - a. Petition of Right.
      - (1) Tonnage and Poundage.
    - b. Land's Policy.
    - c. Personal Government.
      - (1) Monopolies and ship money.
      - (2) Hampden.
    - d. Emigration of Puritans.
  4. The Long Parliament.
    - a. Impeachment of Wentworth.
    - b. The Grand Remonstrance.
    - c. The Five Members Seizure.
- B. Civil War 1642-49. The Commonwealth 1649-53—Protectorate (1653-60).
  1. Negotiation of King: Alliance with Scots.
  2. Trial and Execution of King.
  3. The Commonwealth—Rump Parliament.
    - a. Navigation Acts.
    - b. War with Scotland and Ireland.
    - c. Cromwell as Lord Protector.
      - (1) Constitutional Experiment.
      - (2) War with Spain.
      - (3) Fall of Puritan Government.
      - (4) Royalist Reaction.

**C. Restoration and Revolution.**

1. Character and Policy of Charles II.
2. Relation with Louis XIV.
3. War with Holland: Secret Treaty of Dover.
4. Declaration of Indulgence: Test Act, and Exclusion Bill.
5. Whigs and Tories.
  - a. Overthrow of Stuarts: Fear of Catholics.
6. William of Orange—Character.
  - a. Revolution of 1688.
  - b. Bill of Rights 1689.
  - c. Act of Toleration.
  - d. Act of Settlement.

Problem:

Expansion of Europe Over the World.

**A. Expansion of European Civilization:**

1. Explorations of Spain in America.
2. Explorations by French in America.
3. Explorations by English in America.

Problem:

Contrast Spanish, French and English Settlements in America.

**B. Trading Companies Formed—French, Dutch and English.****C. Struggle for the East in the 18th Century.**

1. Decline of Portugal.
2. Rivalry of England, Holland, France and Spain.
  - a. Struggle for India.  
Struggle Cline and Duplex.
  - b. Spain in Philippines.
3. Conflict of French, English—Dutch and Spanish in North America.
  - a. French and Indian War.
  - b. American Revolution.
  - c. Acquisition of territory at Spain's Expense.

References: Cheyney—Short History of England.

Cheyney—Social and Industrial History of England.

**Struggle for Balance of Power in 18th Century:**

- A. Ascendancy of France Under Louis XIV.
  - 1. Richelieu and Absolute Monarchy.  
Huguenots—nobles.
  - 2. France Supreme on Continent.
  - 3. Louis XIV and His Court—Versailles.
    - a. Louis' Paternalism.
    - b. Art and Literature—Royal Academy.
  - 4. The People and Colbert's Reforms.
    - a. Taxation and its Burdens.
    - b. Encouragement of Industry and Commerce.
      - (1) Effect of Revolution of Edict of Nantes.
  - 5. Louis XIV Prepares War for Revolution.
    - a. Extravagance of his Wars.
- B. England's Preparation for Struggle.
  - 1. Establishment of Constitutional Government.
  - 2. Closer Union with Ireland and Scotland.
- C. Second "Hundred Year's War" (1701-1815).
  - 1. War of Spanish Succession 1701-14.
    - a. Marlborough—Treaty of Utrecht. Blenheim 1704.
  - 2. War of Austrian Succession 1740-48.
    - a. Pragmatic Sanction.
  - 3. Seven Year's War 1756-63.
    - a. Frederick the Great—William Pitt.
  - 4. American Revolution 1776-1783.
  - 5. France Secures Lorraine 1766.
  - 6. French Revolution 1789-99.
  - 7. Napoleonic Wars. 1799-1815.

**Rise of Russia and Prussia:**

- 1. Formation of Russian Empire. Peter the Great.
  - a. Slavic Races and Characteristics.
    - 1. Oriental Inferences.
- 2. Peter the Great—Character Travels and Reforms.
- 3. Expansion of Russia in 18th Century Due to Search for seaports.
  - a. In the Baltic Rivalry for Control by Sweden, Denmark, Poland, Russia.
    - 1. Charles XII of Sweden and Battle of Pultorra in 1709. St. Petersburg on Baltic.
  - b. In Turkey and on Black Sea, Azor.



4. Catherine II (1762-96). Wars with Turkey Conquest of North Shore.
  - a. Partitions of Poland 1882, 1793, 1795.
  - b. In Siberia—Early Settlement.
5. Beginnings of the Prussian State (1640-1740).
  - a. Hohenzollern before 1640.
    1. Acquisitions of territory.
  - b. Task of the Hohenzollerens.
  - c. Frederick William I Great Elector.
    1. Gains of territory from Treaty of Westphalia.
  - d. Title of King in Prussia (1701).
  - e. Frederick William I.
    1. Prussia a Military State.
      - a. Potsdam Giants.
    2. Prosperity of Country.
  - f. Frederick the Great (1740-86).
    1. In War—Military Genius.
    2. Pragmatic Sanction—Raid on Silesia.
    3. Foreign Policy.
    4. Share in Partitions of Poland.
    5. Frederick in Peace—Paternalism.
6. Decline of Spain in 18th Century.
7. Absence of Unity in Italy.
8. Austria a Polyglot Nation—Maria Theresa.
  - a. Effect of Great Wars.
    1. The French Revolution (1789-99).

### **Growth of Democracy:**

1. The French Revolution (1789-99) and its influences upon other peoples.
  - A. Survey of the civilization of the world in 1789 would be helpful. New regime in America: old regime in Europe, England under the autocratic George III: 360 German States in Holy Roman Empire dominated by rivals, Austria and Prussia; Russia was ruled by Catherine II, an absolute monarch; Italy was a collection of petty states; so-called republics in Holland and Switzerland. Europe was aristocratically organized with the masses as peasants, crushed by taxes, and discriminated against socially and politically. Religion was controlled by the state, and aggressive wars were numerous.

## B. Periods of the French Revolution:

1. Attempts to reform France under a benevolent despotism. (1774-89).
2. France under states general, national assembly, and legislature assembly. (1789-92).
3. The Convention. (1792-95).
4. The Directory. (1795-99).

## C. Description of Old Regime in Europe:

1. Government.
2. Society: three classes; Clergy, Nobility and Third Estate.
3. Industry.
4. Education.
5. Abuses and Evils of old regime.
  - a. Injustice of government:
    - (1) lack of uniform laws; lettres de cachets, taille, gabelle, excise duties, favorites, and extravagance.
  - b. Survival of feudal abuses.
  - c. Economic evils.
    - (1) lack of good roads, of freedom of labor, lack of freedom of commerce; poverty, hardship of peasants and parish priests.
  - d. Restrictions on liberty.

Problem: Show how the Court of Versailles illustrated the injustice, extravagance, as well as the culture of Louis XIV's time.

## D. Growth of Revolutionary Spirit:

1. "Parlements" of the 18th century.
2. Influence of English writers and history.
3. Influence of Montesquieu, Voltaire, Rousseau, Diderot, and Quesuay.
4. Influence of American Revolution.

## E. Attempts at Reform by Louis XVI:

1. His character, and marriage, Marie Antoinette.
2. Nation's finances: Turgot, Necker, and Calonne.
3. Estates General summoned, May 1, 1789.

F. France under states general, national assembly and legislature assembly. (1789-92):

1. Destruction of the old Regime: Voting
  - a. Sieges and Mirabeau.
  - b. Famous Tennis Court Oath June 20.
  - c. Storming of Bastille—July 14.
  - d. Outbreak in Rural Districts.
  - e. Tricolor adopted.
  - f. Social Revolution of August 4.
  - g. March of Women: Bread Riots.
2. New constitution:
  - a. Declaration of Rights of Man: Lafayette.
  - b. Sovereignty of people and separation of powers:  
France a constitutional monarchy.
3. Confiscation and sale of church lands.
4. Civil Constitution of the Clergy.
5. Assignats.
6. Flight of Nobles and King: Effect.
  - a. New Republican Parts formed.
7. Jacobins and Girondists: Rebellion in Vendee.
8. Opposition to Revolution outside of France:
  - a. Declaration of Pelnitz: Effect on France.  
(1) United factions to declare war on Austria.
  - b. Manifesto of Duke of Brunswick.  
(1) Marseillaise.
9. Revolutionary Commune of Paris:
  - a. Suspension of King.
  - b. Convention called to make new constitution.
  - c. Marat and the Press.
  - d. September Massacres.
  - e. Valmy—Sept. 20, 1792.

G. France under the first Republic 1792-95:

1. Trial and execution of King and Queen.
2. Revolutionary Committees of Safety.
3. Union of forces vs. outside foes.
  - a. Civil War threatened between bourgeoisie and proletariat: Jacobins and Girondists: Expulsion of Girondists.
4. Radical Commune Rule.
  - a. Danton, Robespierre.

5. Constitution of Year III: *bourgeoisie republic*.
6. Bonaparte's "Whiff of grape shot."
7. Achievements of Conventions:
  - a. Metric System, laws codified, educational system planned, Louvre Museum Established and National Library.

Topics: Select character in Charlotte Corday, Marie Antoinette, Guillotine, The Paris Mob, for study and class reports.

#### H. The Directory (1795-99):

1. The nations make peace with Republic but France at War with England.
  - a. Jourdon and Moreau.
  - b. General Bonaparte.
    - (1) Life—character—siege of Toulon.
    - (2) Marriage.
    - (3) Campaign in Italy.
      - (a) Treaty of Campo Formio.
    - (4) Egyptian Campaign in hope of injuring England.
      - (a) Reasons for failure.
2. Unpopularity of Directory:
  - a. Coalition of England—Russia and Austria.
  - b. Coup d'Etat of Napoleon (1799).
    - (1) Consulate Established.

### Napoleonic Era 1799-1815 and its World Results:

#### A. Consulate 1799-1804.

1. Constitution of the Year VIII.
  - a. Napoleon first consul—powers.
2. War vs. the second coalition.
  - a. Moreau.
  - b. Second Italian Campaign of Napoleon.
    - (1) Treaties of Luneville and Amiens.
3. Interval of Peace.
  - a. Concordat with people 1801.
  - b. Educational organization public improvements.
  - c. Sale of Louisiana to U. S. (1803).

#### B. The Napoleonic Empire (1804-15):

1. Made Emperor in 1802: his court.

2. Period of War; England chief enemy.
    - a. Sea Power vs. land power.
    - b. Coast Blockade—Berlin and Milan Decrees.
    - c. Orders in Council.
    - d. Imperial Campaigns—Ulm and Austerlitz.
      - (1) End of Holy Roman Empire.
      - (2) Confederation of Rhine.
      - (3) Battle of Jena.
      - (4) Campaign vs. Russia.
        - (a) Treaty of Tilsit.
  3. National uprisings vs. Napoleon.
    - a. The Spanish Revolt—Joseph.
    - b. The Austrian Revolt.
    - c. The Russian Opposition.
    - d. Uprising in Prussia.
    - e. War of Liberations.
  4. Downfall of Napoleon (1813-15).
    - a. Leipsic.
    - b. Elba.
    - c. First Restoration and Charter 1814.
  5. Waterloo 1815—Napoleon's Return.
    - a. The "Hundred Days."
    - b. St. Helena.
- C. Permanent Contribution of French Revolution and Napoleon.
- I. Political:
    1. Repudiation of Divine Right Ideal.
    2. First Experiment in Modern European democratic form of government.
    3. Written constitutions.
    4. Liberty of speech, press, thought.
    5. Codification of laws.
    6. Right of revolt vs. tyranny.
  - II. Social:
    1. Overthrow of feudalism.
    2. Rise of Middle Class to power.
    3. New freedom for common people.

## III. Economic:

1. Destruction of old guilds.
2. National industry encouraged.
3. Prepared way for Industrial Revolution.

## IV. Education:

1. Theory of public education.
2. Modern Science.
3. Rise of New Literature.

## V. Religious:

1. Religious liberty and toleration.
2. Example for separation of Church and State.

## End of First Semester

## VI. Period of Reaction and Restoration.

- A. Metternich and his theory of government.
- B. Treaty of Paris 1814.
- C. Congress of Vienna: Leaders
  1. Problems settled:
    - a. "Legitimacy."
    - b. Disregard of Nationalism and Democracy.
- D. Holy and Quadruple Alliances:
  1. Systematic Repression of all liberal ideas.
- E. Bourbon Restoration in France:
  1. Louis XVIII and Charter of 1814.
  2. Charles X (1824-30).
- F. Bourbon Restoration in Spain, Ferdinand VII:
  1. Suppression and return to Old Regime.
- G. Portugal Under England: Italy under Austria.
- H. Reaction in England under Tories (1815-30):
  1. British Government Reactionary at Home:
    - a. Inadequacy of representation.
    - b. Corn Laws—Inclosure.
    - c. Six Acts 1819.
- I. Russia Under Alexander I:
  1. Liberal and Reactionary Moods.
  2. Reaction under Nicholas (1825-55).
- J. Autocracy in Central Europe:
  1. Austria's Power in Europe.

Problem: Show how in period of 1815-48 when reac-



tionary powers were ruling democratic ideals were everywhere in evidence as undermining influences to autocracy.

## VII. Industrial Revolution and the growth of Democracy :

### A. Industrial Revolution : Importance

1. Reasons for its start in England : spread to rest of world.
2. Causes.
3. Principal Mechanical Inventions.
4. Economic Effects.
5. Social Effects.
6. Political Effects.

### B. Political Revolutions :

1. Revolution in Spain 1820.
2. Revolt of Spanish American Colonies in 1820-25.
  - a. Influence of American and French Revolutions.
  - b. Monroe Doctrine 1823.
3. Revolts in Portugal and Italy :
  - a. Carbonari.
  - b. Austrian and Prussian troops suppress Revolt.
4. Greek Revolution (1821-29) :
  - a. Intervention of Russia, England and France.
  - b. Battle of Navarino.
  - c. Independence of Greece.
  - d. Beginning of *Near Eastern Question*.
5. Revolution of 1830 :
  - a. Reasons for its appearance in France.
    - (1) New Constitution Under Louis Philippe.
  - b. Spread of Revolution Over Europe :
    - (1) Belgium and Holland separate.
    - (2) Polish attempt to overthrow Russia.
    - (3) Attempts in Austria and Italy.
  - c. Reform Bill of 1832 in England :
    - (1) Emancipation of Slaves in Colonies.
  - d. Triumph of Western Democracy in U. S. in election of Andrew Jackson.
6. Revolution of 1848 :
  - a. Appears first in France—Ideals and principles.

## Reasons:

- (1) Arbitrary Rule and Weak Foreign Policy of Louis Philippe.
- (2) Rise of Socialists: Louis Blanc.
  - (a) Problem of working class.
  - (b) "June Days:" Workshops.
- (3) Triumph of Middle Class.
- (4) Election of Louis Napoleon (1848).

## 7. Spread of Revolution Over Europe:

- a. Berlin Riots—Constitution of 1850.
  - (1) Frankfort Parliament: Carl Schurz.
  - (2) Thwarted by Austria.
- b. Conflict Between Democracy and Nationalism in Hapsburg dominions.
  1. Revolts in Vienna, Hungary, Bohemia and Italy.
    - (A) Put down by force.
  2. Beginnings of Constitutional government in Sardinia and Hungary 1848.
    - (B) Louis Kossuth.
- c. Chartist Movement in England.
- d. Dutch Constitution of 1848.

## Problem:

1. Show how these revolutions in Europe in 1848 affected the U. S. particularly from the standpoint of immigration.
2. Show how the year 1848 was one of constitution forming all over Europe and America.

## D: The Rise of Socialism:

1. As a result of French revolution and later revolutions.
2. As a result of Industrial Revolution.
3. The Utopians; Saint-Simon, Fourier; Robert Owen—The New Harmony Colony in Indiana (1825).
4. Louis Blanc—"Organization of Labor."
  - a. Idea of Social Workshops.
5. Karl Marx—"Factor of Modern Socialism."
  - a. "Communist Manifests."
6. Spread of Socialism among workers.
  - a. Social and political results.
7. Anarchism and Syndicalism. I. W. W. and Bolshevism

E. Social, economic, religions and educational reforms in Great Britain.

1. Reforms under the Tories in 1830.
2. Revision of Criminal Code.
3. Restrictions removed from Workers meeting.
4. Non-Conformist and Catholic Emancipation 1828 and 1829.
5. Abolition of slavery 1833; Penury Post 1840.
6. Factory Act (1833) Poor Laws (1834).
7. Prohibition of women and children in mines 1842.
8. Repeal of Corn Laws (1842).

Problems: Contrast this era of reform in England with Political conditions on Continent and in United States in the same period.

**VI. Development of Nationalism after 1848:**

A. Evidences before 1848:

1. Influence of America and French Revolution.
2. Nationalism a factor in overthrow of Napoleon.
3. Hostility of Metternich toward Nationalism.
4. Congress of Vienna ignored.
5. Efforts for National Unity in various revolutions in 1820-30 and 48.
6. Patriotic literature in Germany and Italy.
7. Disastrous effects of race nationality in Revolution of 1848 in Austrian Empire which helped defeat democracy.

B. France under Louis Napoleon (1848-71).

1. Second French Republic (1848-52).
  - a. Louis Napoleon as president.
  - b. Coup d'Etat of Dec. 2, 1851.
2. Second French Empire (1852-70).
  - a. Period of popularity (1852-60).
    - (1) Workingmen's societies.
    - (2) Commercial prosperity.
    - (3) French in Cochin China and Annam-Cambodia.
    - (4) Mexican Episode (1861-67).
    - (5) The Crimean War (1854-56).
    - (6) Italian Intervention. (1859).
  - b. Rise of clerical and republican hostility.
  - c. War with Prussia—Overthrow of Empire.

## C. Unification of Italy :

1. Preparation—Work of Napoleon.
2. Effect of National uprisings in 1830-48.
3. The Carbonari and Young Italy :
  - a. Mazzini—Charles Albert and constitution of 1848.
4. Cavour's Plan :
  - a. Part in Crimean War.
  - b. Military Alliance with France to drive Austrians out of Italy.
5. Austro-Sardinian War 1859 : Alliance
  - a. Lombardy granted to Sardinia.
  - b. Nice and Savoy ceded to France.
6. Garibaldi Conquers Naples and Sicily.
7. Venetia Secured by Alliance with Prussia in 1866.
8. Italians take Rome in Franco-Prussian War.
9. Last step—Italy completes her national unity in World War by securing her Austrian frontiers, including Trieste.

## D. Italy Since 1870 :

1. United with a Constitutional form of Government :
  - a. Not a democracy : limited suffrage
    - (1) High per cent of illiteracy.
    - (2) Country controlled by minority.
2. Conflict between Church and State :
  - a. Pope Pius IX Rejects "Law of Papal Guaranties :"
    - (1) "Prisoner of the Vatican."
    - (2) Forbade Catholics to hold office or vote until 1905.
  - b. Catholics Form Popular Party in 1919.
3. Achievements of Bourgeoisie Government :
  - a. Centralized Administration of Country.
  - b. Uniform System of Education Adopted.
  - c. Built and Operated R. R. : Factory System
  - d. Subsidized a Merchant Marine.
  - e. Adopted Compulsory Military Service.
  - f. Made Triple Alliance with Bismarck :
    - (1) Due to quarrel with France over Tunis.
    - (2) This prevented Italy from getting back Trieste and Trentino which Austria held.

- g. Secured Colonial possessions:
    - (1) Eritrea and Somaliland.
    - (2) Tripoli in 1911.
  - 4. Emigration Due to Taxation:
    - a. Poor Economic Conditions.
  - 5. Social Legislation.
- Problem: Compare unification of Italy and Germany.

**E. Unification of Germany—Nationalism:**

- 1. Preparation for German Nationalism:
  - a. Confederation and Revolution of 1830 and 1848.
  - b. Zollverein and its unifying influences.
  - c. William I as king.
  - d. Bismarck's Plan:
    - (1) To create Powerful Army.
    - (2) To use army to increase Prussia's power.
    - (3) To drive Austria out of German Politics.
    - (4) To unite Germany under Prussian rule.
    - (5) To make Germany the dominant power in Europe.
  - e. War with Denmark or Schleswig-Holstein 1864.
  - f. Austro-Prussian War 1866.
    - (1) North German Confederation 1867.
  - g. The Franco-Prussian War 1870-71:
    - (1) Causes—Ems Dispatch.
    - (2) Treaty of Frankfort—Alsace Lorraine.
  - h. Formation of German Empire.

**F. The German Empire becomes Powerful but not Democratic 1870-1914.**

- 1. Constitution of German Empire.
- 2. Bismarck's Foreign Policy 1870-90.
  - a. Triple Alliance 1879-1915.
- 3. German Militarism: "Era of Armed Peace."
  - a. Kept spirit of Nationalism at white heat.
  - b. Developed Pan-German League.
  - c. Overawed Poles in Prussia and French in Alsace Lorraine.
  - d. Enabled Germany to take hegemony of Europe.
  - e. Was bulwark of Junker class and Hohenzollern Emperor.

4. German Paternalism: Inherited from 18th century Prussia.
  - a. Object.
    - (1) To strengthen federal government.
    - (2) To foster material prosperity of country.
  - b. Uniform coinage.
  - c. Fostering of Business.
    - (1) Tariff.
    - (2) Social Legislation.
      - (a) To aid working class and to thwart advance of socialism.
5. German Imperialism.
  - a. Merchants and missionaries parts.
  - b. Togoland, Kamerun, German East and Southwest Africa, Pacific Islands.
  - c. Berlin to Bagdad railroad.
    - (1) Government subsidies.
6. Popular Opposition in Germany:
  - a. Oppressed Nationalities: Danes, Poles, and French in Alsace-Lorraine.
  - b. Center Party—An Outgrowth of the Lultuskaupf to resist "Prussianization" of Germany.
  - c. The Socialists and Democrats.
7. Kaiser William II (1888-1915).
  - a. Quarrel with Bismarek (1890).
  - b. His policies.
- G. Formation of Dual Monarchy of Austria-Hungary:
  1. Racial character of empire.
  2. Losses in Territory 1860-70.
  3. Ausgleich in 1867.
  4. Personal Union under Francis Joseph (1848-1917).
  5. Deep discontent of Italians and Slavs.
  6. Interest in Balkans:
    - a. Berlin Congress 1878.
    - b. Bosnia and Herzgovina occupied 1878, and annexed in 1908.

The Third French Republic 1870-1914:

1. Patriotic efforts of Cambetta.



2. The National Assembly 1871-75:
  - a. Suppression of Paris Commune:
    - (1) Bourgeoisie Triumph.
  - b. Monarchists in Power:
    - (1) Division over King.
  - c. Republican Constitution adopted 1875:
    - (1) Nature of this Document.
3. The Third Republic favors Middle Class and Peasantry:
  - a. High Tariff adopted.
  - b. Small amount of Social Legislation.
  - c. Growth of Socialist Party.
4. Intense Nationalism:
  - a. Favored recovery of Alsace Lorraine.
  - b. Favored Army Reorganization.
  - c. Favored State Schools.
5. Foreign Policy:
  - a. National antagonism to Germany.
    - (1) Drew France and Russia Together in 1890.
      - (a) Dual Alliance.
    - (2) Drew France and England together in 1904.
      - (a) Entente Cordiale.
  - b. Colonial Successes:
    - (1) French Indo-China enlarged.
    - (2) Islands including Madagascar acquired.
    - (3) French rule extended in Africa.
6. Dangers to Third Republic:
  - a. Monarchist Revival.
    - (1) Supported by Clergy.
      - (a) Due to anti-Catholic measures.
  - b. Conflict with Catholic Church.
    - (1) Pope in 1892 urged support of Republic.
    - (2) Expulsion of Religious orders.
    - (3) Confiscated Church Property.
    - (4) Complete separation of Church and State.
    - (5) Lessening of tension during war.
  - c. Fear of Military Dictatorship.
    - (1) Through influence of army.
    - (2) General Boulanger.

- (3) The Dreyfus Affair (1890-1906):
- (a) History of case.
  - (b) Corruption of army revealed.
  - (c) Monarchists dealt serious blow.
  - (d) Army republicanized.

Problems:

1. Russia's lack of a warm port was the cause of her expansion policy.
2. Show what the effect of the industrialization of the Western World had upon China.
3. Show what the trouble zones of the world have been, and why they have been the causes of friction.
4. Show how trade imperialism is a direct result of the industrial revolution, and how wars tend to follow in the footsteps of such imperialism.
5. Show how Imperialism was the chief underlying causes of the World War.
6. Were the nations of Europe justified in taking land in Asia and Africa?
7. How did secret diplomacy help to bring about the World War?

The Russian Empire (1825-1914):

1. Autocratic rule of Nicholas I (1825-55).
  - a. Supported Orthodox Church.
  - b. Crushed Polish and Decembrist Revolts.
  - c. Punished all liberals.
    - (1) Aided Greece only in name of Religion.
2. Alexander II (1855-81). Liberal Period.
  - a. Not a militarist: reformer.
  - b. Emancipation of Serfs: Study of Russian peasantry.
  - c. Establishment of Zemstvos 1864.
  - d. Judicial reforms.
  - e. Reactionary period 1865-81.
    - (1) Polish Insurrection of 1863.
    - (2) Secret Police: Third Section.
    - (3) Rise of revolutionists.
      - (a) The Terrorists.
      - (b) Nihilists and Anarchists.
      - (c) Assassination of Czar (1881).

3. Alexander III (1881-1894).
  - a. Reactionary in policy: Believed in Slavic Nationalism and Eastern Orthodoxy.
  - b. Policy of Russification: Pan-Slavism.
    - (1) Persecution of Jews—Pogroms.
  - c. The Industrial Revolution in Russia.
    - (1) Shifting of Population to towns.
    - (2) Building of Trans-Siberian R. R.
      - (a) Influence of France—Count Witte.
    - (3) Colonial Expansion.
4. Nicholas II (1894-1917).
  - a. Continued “Russification” policy: Bitter racial hatreds.
  - b. Russian influence in Balkans:
  - c. Russian influence in Far East.
    - (1) Brings on Russia-Jap War (1905).
      - (a) Attempt to control Manchuria.
      - (b) Corruption in Russian Army.
      - (c) Unpopularity of War.
      - (d) Japanese Victory, Treaty of Roosevelt.
  - d. Revolutionary Movement in 1905: Dumas Granted.
  - e. The Finnish Question 1905-14.

The Near Eastern question on Dismemberment of Ottoman Empire 1683-1914:

- I. Failure of Turks to capture Vienna in 1683:
  1. John Sobieski.
- II. Austrian and Russian Gains at Turkish Expense in 17th and 18th centuries.
- III. Napoleonic Invasion (1798).
- IV. Ottoman Empire in 1815.
  1. Misgovernment of Sultan: Treatment of Christians.
  2. Balkan States: Serbs, Bulgars, Greeks, Romans, Albanians, Gypsies and Jews.
  3. Dismemberment of Turkish Empire.
    - a. Independence of Montenegro 1799.
    - b. Greek Revolt 1832.
    - c. Autonomy of Rumanian Provinces 1829.
    - d. Russian Policy in Near East.
      - (1) The Crimean War 1854-56.
        - (a) Checks Russia's Advance.
  4. Great Britain's Role in Balkans.
    - a. Supports Turkey rather than Russia.

5. Russo-Turkish War (1877-78).
  - a. Congress of Berlin.
6. Autonomy of Crete and Turkish losses in Africa.
  - a. English and French in Egypt.
  - b. France in Algeria and Tunisia and Morocco.
  - c. Italy in Tripoli in 1911-12.
7. Young Turk Movement 1910-12.
8. Balkan Wars 1912-13:
  - a. Macedonian and Albanian Controversy.
  - b. Balkan Alliances and Campaigns.
  - c. Treaty of London 1913—War over spoils.
    - (1) Turkey out of Europe—Great Powers Intervene.
  - d. Treaty of Bucharest, Aug. 10, 1913.
    - (1) Gains of each Balkan State.
    - (2) Albania an independent state.
    - (3) Intensification of National Rivalries in Balkans.

Problem: Show what specific interests each of the Great Powers had in the Near East, and how these were responsible for keeping Turkey in Europe.

### British Empire 1837-1914.

#### I. The Victorian Age 1837-1901.

##### A. Strictly "Limited" Monarchy.

1. England first nation to destroy autocracy, one of the last to establish democracy.
  - (a) Masses had no part in government until after 1867.

##### B. Reform Bills of 1832, 1867 and 1884.

- a. Political Parties: Liberals and Conservatives.
  - (1) Gladstone and the Liberal Party.
  - (2) Rise of the Labor Party.
- b. John Bright and The Radicals.
  - (1) Disraeli and The Conservative Party.
- c. Lloyd George and Parliament Act of 1911.
- d. Reform Act of 1918 completes Political Democracy.

#### II. Social Reform in England.

##### A. The Land Problem: large estates.

- (1) Enclosure System and primogeniture.
  - (a) 4000 owned  $\frac{4}{7}$  of Kingdom.
  - (b) Nobility of 2000 owned  $\frac{1}{2}$  of enclosed land in England, Wales, Ireland and Scotland.

Problem: Show how the land problem in England was tending to make England, which was politically democratic, an aristocratic country socially.

(2) Demand for Land Reforms: Lloyd George.

(a) Laws of 1913.

(b) Great War and Taxes reduced estates.

B. The Labor Problem:

1. England the Cradle of the Industrial Revolution.

a. Predominantly an industrial nation.

b. Laissez-faire system supported by business men.

c. Free Trade in England: Corn Laws Repealed in 1846: Opposition of Chamberlains Party in 1906.

d. Trade Unionism in England.

C. Social Legislation 1906-14—Lloyd George and Liberals:

1. In Behalf of Lower Classes.

a. Workmen's Compensation Act.

b. Trade-Union Funds Protected.

c. Labor-Exchanges Established.

d. Minimum Wage Laws.

3. Expansion of British Empire: Effect of Nationalism.

a. Conservative Party in 1874 turns towards Imperialism: Disraeli's Achievements.

(1) Acquisition of Control in Suez Canal.

(2) Queen Victoria Becomes "Empress of India."

(3) England Blocks Russia's Attempts to Dismember Turkey in 1878.

(a) Secures as reward *Cyprus*.

b. Expansion 1886-1906:

(1) India enlarged at expense of Burma, Siam and Afghanistan.

(2) Wei-Hai-Wei obtained from China.

(3) Acquisition of Pacific Islands.

(4) Share in Partition of Africa.

(5) Occupation of Egypt and Sudan.

(6) Boer War (1899-1902) and South African Republic Established later.

(7) "Cape to Cairo" R. R.: Cecil Rhodes.

(a) Conquest of Germans in Africa in 1918 made possible construction of 5,000 miles of the railroad entirely on British Soil.

Problem—Trace the Expansion of British Empire from 1874-1918. Geography Drill very valuable and timely at this point of work.

4. Government of British Colonies.

a. No uniform system.

(1) Self-governing Colonies.

(a) Canada, New Zealand, Australia and South Africa, Ireland since 1921-22.

b. The British Navy.

Problem—A detailed study of India, Canada, New Zealand and Australia as time permits.

5. British Foreign Policy. 1874-1914.

a. Rivalry with France and Russia from 1874-1904.

(1) Entente Cordiale 1907—Russia—England—France.

b. Alliance with Japan in 1902.

c. Acute Rivalry with Germany from 1900-14.

6. Ireland Obtains Self-Determination.

a. Irish Nationality—language, religion, culture.

b. British Oppression.

(1) Religious—Tudors—Stuarts.

(a) Plantation of Alster 1609.

(2) Agrarian—"Absentee Landlordism."

(3) Political.

c. Union of Great Britain and Ireland 1800.

d. 19th Century Agitation.

(1) O'Connell wins Civil Rights for Catholics 1829.

(2) Fenian Movement 1848.

(a) Disestablishment of English Church in Ireland 1869.

(3) Nationalist Movement: Parnell and Redmond.

(a) Aims—Land Reform and Home Rule.

(b) Ulstermen and British Unionists.

(c) Agricultural Improvement under Sir Horace Plunkett.

(d) Home Rule Bills 1886-1893-1912-14.

(4) Sinn Fein Movement: De Valera.

(a) Rebellion of 1916.

(5) Establishment of Irish Free State.

(a) Ulster Under Home Rule Act of 1920.



## A. The Far Eastern Question and Imperialism :

## I. "White Man's Burden."

## II. Awakening of Asia.

1. China's history before 1840.
2. Opium War 1840-42.
  - a. Treaty opens Ports : Hongkong.
3. Second Chinese War 1856-60.
4. Westernization of Japan.
  - a. Perry opens Japan 1854.
  - b. Reforms in Government.
    - (1) Feudalism abolished.
    - (2) Reforms of 1867 and 1889.

## III. Chino-Japanese War 1894-95 :

1. Quarrel over Korea.
2. Treaty gives Korea, Formosa and Liao-tung Peninsula to Japan.
  - a. European powers opposition.
    - (1) German emperor starts "Yellow Peril" idea.
    - (2) Attitude of Russia and France.
  - b. European powers partition China.
    - (1) Germany takes Kiao-chao and control of Shan-tung.
    - (2) Russia gains control of Liao-tung Peninsula and control of Manchuria and Mongolia.
    - (3) France secures concessions in Southern China.
    - (4) Great Britain gains lease on Wei-hai-wei—Tibet.
  - c. "Spheres of Influence;" France, Germany, Russia and England.
  - d. Open Door Policy of the United States.

## IV. Attempts to westernize China :

- a. The Boxer War 1900 : Empress Dowager.

## V. Russo-Japanese War—1904-5 :

- a. Cause—Conflict over Korea and Manchuria.
- b. Japan's territorial expansion at China's expense.
- c. England renews alliance 1905.

## VI. Chinese reforms 1905-11 ; Republic formed :

- a. Yuan-Shih-Kai.
- b. Great powers take advantage of weakness.

## B. India under English Rule:

- I. Acquisition by East India Co.
- II. Sepoy Mutiny 1857.
- III. English Rule in India.
- IV. Movement for Home Rule: Nationalists.
  - a. British Objections.

## C. Russian Colonization in Siberia:

- I. Trans-Siberian Railroad, 1892-1905.
- II. Russian expansion blocked by Japan and England.

## D. Persia:

- I. Clash between Russia and England.
- II. Agreement between England and Russia 1907.
  - a. "Spheres of Influence."

## E. Asiatic Turkey and the Bagdad Railroad:

- I. Constantinople connected with Bagdad and Persian Gulf.
- II. Opposition by Russia and England.

## F. The Partition of Africa:

- I. European Possessions before 1880.
- II. Nationalism and Missions and Industrial Revolution revive interest.
  - a. Explorations of Livingston and Stanley.
- III. Cape-to-Cairo Scheme: Cecil Rhodes.
  - a. Portuguese, German and French obstacles.
    - (1) Fashoda incident.
  - b. The Boer War 1899-1902.
    - (1) Paul Kruger, Jan Smuts and General Botha.
4. Morocco Crisis 1905 and 1911:
  - a. Algeciras Conference 1906.
  - b. Agadei Incident.
5. Italy's Bargain with France and Italy:
  - a. Libya.
6. Abyssinia and Liberia remain Independent.

## H. The World War:

- I. Causes for War and Conferences:
  1. International Conferences.
  2. Territorial Disputes.
    - a. Trent and Trieste.
    - b. Alsace and Lorraine.

## c. Oppressed Nationalities.

(1) Poles.

(2) Danes.

## 3. Militarism and Navalism.

## 4. Secret Diplomacy.

a. Bismarck's Diplomacy (1871-1890).

b. Triple Alliance 1882.

## 5. Dual Alliance 1890.

## 6. Anglo-Russian Entente 1907: Triple Entente.

## 7. Japan's and Italy's Position.

## 8. The Balance of Power.

## II. International Crises:

1. Morocco Crisis 1905 and 1911.

2. Balkan Crisis of 1912-13.

## III. Immediate Cause of War: Assassination of Austrian Archduke and Ultimatums:

1. All Europe Involved.

2. Impossibility of Limiting War to Austria and Serbia.

3. Declaration of War Between July 28, 1914 and May 23, 1915.

4. Violation of Belgian Neutrality.

## IV. The First Year of the War: General War Aims.

1. Victory of the Marne—Joffre and Foch.

2. Hindenburg Checks Russian Advance in the East.

3. Serious German Losses in Shipping and Colonies.

4. Submarine Activity—Von Tirpitz.

5. Unrest in Balkan States.

## V. Second Year of War. (1914-15):

1. Failure of the Gallipoli Campaign vs. Turkey.

2. Failure of Germans at Verdun.

3. Bulgaria joins Central Allies.

4. Invasion and Occupation of Balkan States by Germany.

5. Attack on the Somme.

6. Russian Advances.

## VI. The Third Year of War (1916-17):

1. Entrance of Rumania on side of Allies.

a. Her Defeat and Conquest by Central Powers.

2. Unrestricted Submarine Warfare of Germany.
3. United States Joins Allies—Pershing and the A. E. F.
4. Other Nations follow United States.
5. The Hindenburg Line.
6. British successes in East—Jerusalem.
7. The Russian Revolution.
  - a. First and Second Stages.
  - b. Bolshevism.
  - c. Soviet Government.

VII. The Fourth Year of War (1917-18) :

1. Collapse of Revolutionary Russia.
  - a. Treaty of Brest-Litovsk.
2. Italian Campaign—Stand at the Piave.
3. German Drives in France—Counter-drives.

VIII. The Fifth Year of War (1918-19) :

1. Allied successes on all fronts.
2. Large American Forces.
3. Demand of Central Allies for Separate Peace.
4. Collapse of Bulgaria and Turkey.
5. The Armistice.

I. Peace Proposals and Conferences :

- I. War Aims and Issues Involved.
- II. Peace Proposals of Benedict the XV.
- III. Wilson's Fourteen Peace Points.

### Problems

1. Explain how the physical geographical conditions of Europe affected her political development and the character of her populations.

2. What important political problem is suggested to you by the failure of national boundaries to correspond with national feeling? Illustrate.

3. Study the transportation systems of England, France and Germany at the outbreak of the World War.

4. Study the Trade Relations and Policies at the outbreak of the World War, stressing particularly the rival trade policies of Great Britain and Germany.

5. Show how protectionism is a policy of a militaristic state.

6. What were underlying racial and national jealousies back of the immediate cause of the war.

7. Show the Steps by which the United States was drawn into the World War.

IV. Congress of Paris in Hall of Mirrors:

1. The Influence of the "Big Four."
2. The Terms of the Treaties.
  - a. Dismemberment of Austria-Hungary.
  - b. Cessions by Germany.
  - c. Partition of Ottoman Empire.
    - (1) Self-determination.
3. Gains of the Victorious Great Powers.
  - a. England, France, Italy, and Japan.
4. The League of Nations—Covenant.
  - a. Woodrow Wilson the Champion.
  - b. American Opposition—Lodge.
  - c. Adoption Without United States.

V. The Washington Arms Conference 1921-22.

J. Political Democracy in Central Europe.

- I. German Revolution 1918-19: Ebert.
- II. Revolution in Austria Hungary.
  1. Flight of Emperor.
- III. Poland Restored as Independent Power.
- IV. Baltic States Set up Government.
- V. Spread of Political Democracy.

K. Bolshevism Replaces Autocracy in Russia:

1. Middle Class Government Fails.
  - a. Kerensky's Dictatorship.
2. Bolsheviks Policy: Levin and Trotsky.
3. Soviet Government.
  - a. Influence of Proletariat.

L. The World Today:

- I. Isolation a Thing of the Past.
- II. Problems of Urban Life.
- III. Social Equality—Capitalism and Socialism.

## IV. Women's Rights.

1. Enfranchisement of Women.
2. Economic Equality.

## V. Development of Capitalism:

1. Growth of Wealth and Corporations.
2. Development of Scientific Knowledge Applied Science.
  - a. Transportation.
  - b. Electricity.
  - c. Medicine and Surgery.
    - (1) Pasteur and The Germ Theory.
    - (2) X-Ray.
  - d. Appliance of Science to Warfare.
  - e. "Darwinism" and Higher Criticism.



## UNITED STATES HISTORY

### Half-Year Course

#### I. Period of Discovery and Exploration:

Background of European History to show first century of American History as part of expansion of Europe.

No detailed accounts of explorations, but summaries of results as cause for later historical phenomena.

#### II. Colonial History:

Study of Virginia and Massachusetts settlements to show reasons for resistance to superimposed authorities of England, and to show development of leaders of progressive type. Study of colonial institutions and customs. Study of elements of unity and heterogeneity. Types of education and thought. No detailed study of history of charters, etc.

#### III. Colonial Wars:

Study as parts of European struggle with little attention to any details as great factors in world history. Development of leaders and independent spirit of colonists. Compare French and English rule of colonies.

#### IV. Separation from England:

1. Spirit of 1765—in England—in America.
2. Different theories of government in England and America.
3. Acts causing friction.
4. Acts of friction before open hostilities.
5. Open hostilities—some detail as to leaders, campaigns. Skill of few great leaders—difficulties. Foreign aid and its influence.
6. Treason of Lee, Arnold and others.
7. Intensive study of Declaration of Independence.
8. Results of the war.
9. Influence of West in Revolution.

#### V. Critical Period:

1. Articles of Confederation and Western Lands.
2. Drifting toward anarchy.
3. Failure of attempts to strengthen Congress.
4. West and Ordinance of 1787.

5. Framing a Constitution :
  - a. Trade relations of colonies.
  - b. Constitutional Convention.
    1. Leaders.
    2. Deliberations.
  - c. Compromises of Constitution.
  - d. Ratification.

Detailed study of document under Civics.

## VI. Federalists and Republicans :

1. Washington's administration.
  - a. Careful study of preliminary steps of government as laying basis of financial policy of United States.
  - b. Affairs in Europe and our relation to them.
    1. Treaties with England and Spain.
    2. Abrogation of Treaty of 1778.
  - c. Formation of political parties.
    1. Leaders and lines of cleavage.
2. Adams' Administration :
  - a. Foreign relations—France and England.
  - b. Fall of Federalists.
    1. Repressive Acts against Republicans.
    2. Protest against Federalists.  
Kentucky and Virginia Resolutions.
    3. Last stand of Federalists.  
Federal Judiciary Act and Midnight Appointments.
3. Jefferson and New Democracy :
  - a. Theories of democracy.
  - b. Reform measures—navy—army—civil service.
  - c. Louisiana purchase :
    1. Diplomatic relations—extent of territory.
    2. Determines future expansion policy.
  - d. Strained diplomatic relations :
    1. Relations of England and France.
    2. Chesapeake Embargo and Non-Intercourse.
    3. Lack of military and naval preparedness.
    4. War of 1812.
      - a. Provocations—War Hawks—Failures on Canadian front.
      - b. Naval successes—Effects on English attitude.

- c. Sectional opposition—Hartford Convention and State Rights.
- d. Last cry of Federalists.
- e. Results of War.

## VII. Development of Nationalism:

- 1. Growth of Sections:
  - a. Physical barriers overcome by invention and expansion.
  - b. New Democracy in West—Planter Aristocracy.  
Puritan and Commercial New England.
- 2. Marshall and his centralizing decisions.
- 3. Development of roads and canals.
- 4. Beginnings of American Literature.
- 5. Monroe Doctrine an enunciation of national policy:
  - a. Acquisition of Florida.
  - b. Revolutions in Spanish America.
  - c. Careful analysis of Monroe Doctrine.
    - 1. Interpretations.

## VIII. Sectional Interests:

- 1. Election of 1824 as evidence of sectional jealousy.
- 2. Opposition of J. Q. Adams' nationalism:
  - a. Panama Congress.
  - b. Georgia and Indians.
- 3. Tariff:
  - a. Tariff of 1816 unanimous wish.
  - b. Divergence of interests shown in Tariffs of 1824 and 1828.
  - c. Calhoun's Exposition and Protest.
- 4. Growth of West:
  - a. Colonization—Railroads—New political theories.
  - b. Debate over western lands:
    - 1. Webster-Hayne debate over power of nationalism.
- 5. Jackson and Tariff:
  - a. Contradictory elements of Jackson's character.
  - b. Jackson supports Union vs. Sections.
- 6. Jackson and War on Bank:
  - a. Democratic ideals of Jackson.
  - b. Opposition to Bank.
  - c. Veto of Charter—Removal of Deposits.
  - d. Senate Censure.

7. Panic of 1837.
8. New Party Alignments:
  - a. Democrats and Whigs.
  - b. Effect of Inventions and discoveries.
  - c. Triumph of Whigs 1840.
    1. New type of elections and campaigns.

IX. Slavery and Expansion:

1. Restriction measures of 1809.
2. Legislation favorable to slavery to 1819.
3. Missouri Compromise:
  - a. First contest in Congress over extension of slavery.
  - b. Victory for north in restriction.
  - c. Slavery becomes a moral issue.
4. Rise of the abolitionist sentiment 1820-1835:
  - a. Garrison and Liberator—cool reception in North.
  - b. Gag Resolution.
  - c. Demands of South offend moderates of North.
  - d. Rise of Liberty Party.
  - e. Slavery a financial problem for South.
5. Texas and Oregon:
  - a. Settlement of Oregon and wave of migration to N. W.
  - b. Independence of Texas—applies for annexation.
  - c. Marcus Whitman revives interest in Oregon.
  - d. Texas admitted by joint resolution.
  - e. Oregon boundary settlement as checkmate for Texas.
6. Mexican War:
  - a. Victories of United States.
  - b. Treaty of Guadalupe Hidalgo.
  - c. Vast territory admitted with question of slavery to determine.
  - d. Wilmot Proviso and Davis Amendment.
7. Campaign of 1848 and Free Soilers.
8. California:
  - a. Discovery of gold and gold rush.
  - b. California applies for admission as state.
  - c. Compromise of 1850.
    1. Last appearance of "Great Triumvirate."
    2. New fugitive Slave Law—Underground Railroad.
    3. Growth of abolitionist spirit.

## 9. Kansas-Nebraska Bill:

- a. Doctrine of Squatter Sovereignty to take slavery question out of hands of Congress.
- b. Practical repeal of all restrictive measures as to extension of slavery.
- c. Formation of New Republican Party.

## 10. Approaching the crisis:

- a. Civil war in Kansas.
- b. Brooks' Summer Assault.
- c. Dred Scott Decision.
- d. Lincoln-Douglas Debates—Freeport Doctrine.
- e. Election of 1860.
  1. Split in Democratic Party.
  2. Election of Lincoln.
  3. Secession of Southern States.
- f. Vacillation of Buchanan.

## IX. Civil War:

1. Comparison of forces.
2. Economic effects of slavery. Census of 1860.
3. Failure of compromise attempts.
4. How the North financed the war, and why the North finally succeeded.
5. Civil War a nationalizing force. United States a nation after the end of war.

No detailed study of battles and leaders.
6. Development of idea of emancipation.
  - a. Proclamation of 13th Amendment.

## X. Period of Reconstruction:

1. Problem of readmission of seceded states.
2. Punitive measures of North.
3. Corruption of carpet bag government.
4. Attempts of South to negative the reconstruction Acts.
5. Contest between Johnson and Senate as to relation of Executive and Legislative.
6. Fourteenth Amendment for careful study.
7. Foreign relations of Civil War.
  - a. New era of diplomacy.
8. Attempt to reform corrupt conditions.
9. Hayes-Tilden Controversy.

## XI. Height of Republican Power:

1. Currency Legislation.
2. Resumption Act.
3. Civil Service.
4. Campaign of 1884 and election of Cleveland.

## XII. Later political and Industrial History:

1. Cleveland Democracy.
2. Surplus and its disposition.
3. Fight for Tariff Reform.
4. Rise of Labor.
5. Controlling Public Utilities.
  - a. Interstate Commerce Act.
6. Harrison and Neo Republicanism.
  - a. McKinley Tariff and Sherman Silver Act.
  - b. Pan Americanism.
  - c. New Attitude toward world politics.
  - d. Character of Blaine.
7. Return of Cleveland:
  - a. Gold famine.
  - b. Bond Sales.
  - c. Venezuela.
  - d. Pullman Strike.
  - e. Hawaii.
  - f. Rise of William J. Bryan.
8. Entering Twentieth Century:
  - a. Careful study of War with Spain.
  - b. Roosevelt and Panama.
  - c. Later industrial disputes.
  - e. Philippine question.
  - f. Conservation.
  - g. Progressivism.
  - h. Wilson and Currency reforms.
  - i. Clayton Bill.
  - j. Mexican troubles.
  - k. America and World War.



**Civics**

Basis. Federal—State—Local

**Federal Government:**

1. History of framing of Constitution:  
Foundations in English political philosophy—state constitutions—experience.
2. System of Checks and Balances.
3. Interstate Relations.
4. Method of Amendment:
  1. Bill of Rights—careful study.
  2. Reasons for each amendment.
5. Legislative Department:
  1. Advantages of bicameral system.
  2. Sessions of Congress—short session.
  3. House of Representatives:
    1. Reasons for short term.
    2. Compare with British Commons.
    3. Gerrymandering.
    4. Organization and methods of procedure.
    5. Committee system.
    6. Course of a bill.
    7. Finances of Congress—Budget.
    8. Composition.
  4. Senate:
    1. Reasons for longer term.
    2. Composition.
    3. Debate.
    4. Methods of procedure.
    5. Special powers of Senate.
  5. Powers of Congress:
    1. Expressed.
    2. Denied.
    3. Implied.
    4. Powers over Foreign Commerce.
    5. Powers over Interstate Commerce.
    6. Powers of Taxation:
      - a. Exports.
      - b. Excise.
      - c. Income taxes.

7. Miscellaneous powers.
8. Elastic clause and interpretations.
6. Value of Congress to your state and community.
7. How Congress reaches the individual.  
Study of actual workings rather than study of theory.  
Use of government publications.
6. Executive Department:
  1. National Convention for nominating president.
    1. Qualifications for candidate.
    2. Method of choosing candidate.
  2. Electoral system of choosing president.
    1. On proportional representation in electoral college.
    2. Discussion of direct method of election.
  3. Historic elections.
  4. Duties and Powers of President.
    1. Diplomatic.
    2. Military.
    3. Civil Service.
    4. Legislative powers.
      - a. Extra session.
      - b. Veto.
    5. Judicial powers.
  5. Possible functions of Vice President.
  6. Cabinet.
    - cf. British and European cabinets.  
The President and his cabinet.  
Why have certain cabinet heads been removed?
  1. State:
    1. Diplomatic service and its reward.
    2. Consular service—its use.  
Method of securing passports.
  2. Treasury:  
Study of revenues and expenditures, coinage, currency, customs and ports of entry.  
Federal Reserve Bank System—Farm Loan Banks.
  3. Army and Navy.
  4. Post Office:  
Service rendered public—franking  
Fraud order—Rates.

## 5. Interior:

Various activities of interior—patents—pensions.

## 6. Other Departments.

## 7. Commissions and Boards:

Increased as functions of government widen Civil Service—Interstate Commerce—Federal Trade Commission—Tariff Commissions.

## 7. Judicial Department.

## 8. Civil Rights.

## 9. Territories and Foreign Possessions.

At the close of the study of Federal government give close attention to details and language of Constitution as a document and basis for a system of government.

## State Government.

Follow same basis of study as for Federal government showing origins and peculiarities of Colorado Constitution. Thorough study of primary law, home rule provisions, responsibility of state to national government.

Study of State legislation—initiation—referendum recall, and recall of judicial decision. Value of direct legislation. Short ballot.

Powers of the governor and separation of elements of executive. Value of message. Use of pardoning power.

Study of expenditures of state revenues. Various institutions supported by state taxation.

## The Courts:

Functions of justice courts—Importance.

Jury trials—indictment, verdict. Visit jury trial to note procedure. Work of grand jury in community.

Causes of crimes and misdemeanors.

Institutions of correction.

Juvenile Court.

Domestic Relations and other courts.

## County Government:

1. Services performed by County Commissioners.

2. Various officers of county and duties.

3. County and rural education.

4. Geographical township of West.

## City Government :

Types—Mayor, council, commission, manager.

Study of government of large cities. Multitude of services rendered.

Advantages of various types.

Home rule for cities and its advantages.

Legislative control by state over cities.

Public improvements and city tax rates.

Compare city life today with that fifty years ago.

Health and sanitation of cities.

Study of local charters and reports of city officials—study of city elections—mock elections with sample ballots—campaign speeches.

Suffrage—qualifications—exercise—duties—value of woman's suffrage—non-partisan ballots.

## Party government :

Value of party government.

Machinery of party government.

Platforms of major parties.

Importance of minor parties.

State and National Conventions.

## Public Education :

Growth of functions placed on schools.

Increased expense.

Administration of schools.

Vocational guidance and vocational education.

Night schools and adult education.

Decrease of Illiteracy.

Care of defectives and subnormals.

In study of state and city government much attention should be paid to local conditions with aim to knowledge of these conditions, and with increased knowledge, increased interest and attention. Creation of an educated and informed electorate with hope of progressive and sane reforms.

**Suggested List of References for the  
Professional Library of a High School History Teacher**

1. General Discussion of the Subject of History:

1. Robinson, J. H.: *The New History*. Macmillan Co., N. Y., 1912.
2. Mathews, Shailer: *The Spiritual Interpretation of History*.

2. Committee Reports on History in the High School:

1. Committee of fifteen, etc.

3. Books on the Teaching of History:

1. Bourne, H. E.: *The Teaching of History and Civics*. Longmans, Green & Co., N. Y., 1915.
2. Johnson, Henry: *Teaching of History, in Elementary and Secondary School*. Macmillan Co., 1916.
3. Tryon, R. M.: *The Teaching of History in Junior and Senior High School*.
4. Fling, F. N. and Caldwell, H. W.: *Studies in European and American History*, Ainsworth & Co., Chicago.
5. Seward, S. S., Jr.: *Note-taking*. Allyn & Bacon.

4. Syllabic, Outlines and Similar Aids:

1. Armstrong, R. E.: *A Syllabus and Notebook for Ancient History*. Chicago: Atkinson, Mentzer & Co.
2. Iliff, J. G.: *Classroom Manual for Ancient History*. Topeka, Kansas. The Historical Publishing Co.
3. Armstrong, R. E.: *Syllabus and Notebook for Medieval History*.
4. Members of Dept. of History of University of Chicago. *Study for History I, II, III*. Chicago: The University of Chicago Press, 1915.
5. *European Ancient and Medieval*.
  - a. Hoskins, H. L.: *Syllabus for Course in European History*, Topeka, Kansas. Historical Pub. Co.
6. *Modern History*.
  - a. Hayes, C.: *A Syllabus of Modern History*. N. Y. Columbia University Press, 1913.

- b. Hoskins, H. L.: Syllabus for Course in Modern European History (1700-1926). Topeka, Kansas. Historical Publishing Company.
- c. Collected Materials for the Study of the War. A. W. McKinley. McKinley Publishing Co., Philadelphia, Pennsylvania.
- 7. The Historical Outlook: McKinley Publishing Co., Philadelphia, Pennsylvania.
- 8. Asia—
- 9. The Current History.
- 10. The Geographic Magazine.



OUTLINE  
OF  
COMMERCIAL SUBJECTS



**COMMERCIAL SUBJECTS****GEOGRAPHY****I Aims:**

- A. To familiarize the pupil with local geography, its influence on Colorado trade and Colorado people.
- B. To acquaint the pupil with Colorado industries and how they are affected by various parts of Colorado, Wyoming, New Mexico, Utah, and other adjoining states.
- C. To show how the interests of people of various parts of the state are interwoven, how the best development of each of these is best for all.
- D. To extend the principles developed for Denver in the United States in particular and in a general way to the world.

**II—Content:**

- A. Note.—Approach the subject from the standpoint of the pupil and his immediate locality. A week or so might well be spent in discussing questions like the following before taking up the main content of the course:

What are the possibilities in retail business of various kinds? Why are these businesses situated where they are? What towns are usually covered by a salesman with headquarters in Denver? How does he get there? How do the seasons affect his choice of ways? Find out how an automobile tire agency, or wholesale house of any kind, divides its territory among its agents. Why do some have big and some small territories? What does the territory immediately surrounding Denver contribute to local farms, gardens, mountain parks, and so forth? Does Wyoming play a part in our development? Where does the rest of its trade go? Why? Does New Mexico contribute as largely as Wyoming? Why? Of what use is Berthoud Pass? What are other passes? Why did Palmer Lake oppose a changing of the highway to the east of town? Of what use will Moffat Tunnel be to Denver? To North-western Colorado, Salt Lake, Cheyenne?

Stress relationships of people in the same way. What is the effect on business where one group goes on a strike? Are capital and labor opposed to each other in interests?

Pupils and teachers? What are some of the fallacies in the attitudes between teachers and pupils? Between labor and capital? How are wages and products related? (Why has gold mining been below normal in Colorado for some time?)

B. Physical geography basis:

1. Colorado earth crust formations—their contribution to people through: farm lands, grazing lands, forest lands, scenery, mineral deposits.
2. Relation of our forest areas and snowfall to the agricultural interests. (Show how land and agriculture are basic).
3. Influence of our type of climate on Colorado people and Colorado industries.
4. Influence of our mountain ranges on: transportation, distribution of products, state unity.

C. Colorado industries and their relation to world industries:

1. Cereal industries:

- a. Parts of Colorado given over to these industries.
- b. Reason for these production areas, factors determining such areas in other parts of United States and world.
- c. Colorado markets.
- d. United States markets.
- e. Ports of foreign shipment.

2. Meat and dairy industries:

- a. Parts of Colorado given over to these industries.
- b. Reason for such distribution.
- c. Reason for breaking up of the big ranches.
- d. The Denver packing industry.
- e. Wyoming's contribution to Denver in this way.
- f. Regional distribution of this industry in the United States; in the world.
- g. Reasons for fluctuation in prices.

3. Vegetable, fruit, and canning industries:

- a. Parts of Colorado given over to these industries.
- b. Reason for distribution.
- c. Kinds of vegetables and fruits produced.

- d. Disadvantages of high mountain towns.
  - e. Location of canning factories.
  - f. Regional distribution in United States and world.
  - g. Habits of various nations with reference to the use of fruits and vegetables.
4. Sugar:
- a. Parts of Colorado given over to the sugar industry.
  - b. Location of sugar factories.
  - c. Plan of contracting for acreage on basis of ton price.
  - d. Beet sugar versus cane sugar.
  - e. United States sugar regions, world sugar regions.
  - f. Ability of United States to compete with other countries.
  - g. Sugar and tariff.
5. Lumber:
- a. Parts of Colorado given over to lumbering.
  - b. Kinds of lumber produced.
  - c. Migratory nature of the industry.
  - d. The forest service.
  - e. Necessity of conservation.
  - f. Planting of mountain areas.
  - g. Other timber regions in the United States; in the world.
  - h. Kinds of timber used; purposes.
6. Coal:
- a. Parts of Colorado that are rich in coal.
  - b. Kinds of coal found.
  - c. Extent of market for Colorado coal.
  - d. Northwestern Colorado as a coal possibility.
  - e. The importance of coal in manufacturing.
7. Mining:
- a. Kinds.
  - b. Importance in history of state.
  - c. Periods of expansion and depression.
  - d. Present status and reason for it.
  - e. Mining towns.
  - f. Contribution to wealth of state.
  - g. United States mining regions.
  - h. World mining regions.

8. Oil:
  - a. Importance of oil in world situation.
  - b. Location of oil in Colorado.
  - c. Oil shale possibilities.
  - d. What oil may mean to people of Colorado.
  - e. Other oil regions of United States and world.
  - f. Importance of oil in world trade.
9. Manufacturing:
  - a. Denver and Pueblo as manufacturing cities.
  - b. Principles that determine centers of production.
  - c. Reasons for limited manufacturing in Colorado.
  - d. Kinds of Colorado manufacturers.
  - e. Manufacturing as distributed in United States.
  - f. Manufacturing nations.
  - g. Importance of manufacturing in our lives.
  - h. How manufacturing has changed our standard of living.
  - i. How it has affected our labor by doing away with the all-round job and substituting the specialized type.
  - j. Reasons for industrial supremacy of nations.
10. Tourist industry:
  - a. Colorado's resources in this industry.
    - Climate.
    - Peaks.
    - Forests.
    - Flowers.
    - Roads.
    - Snow.
    - Glaciers.
    - Streams.
    - Parks.
    - Fish.
    - Game.
    - Medicinal springs.
    - Winter sports possibilities.
    - Climbing.
    - Motoring.
    - Riding.



D. Other big industries by which we are affected :

Tobacco.  
Fisheries.  
Shipping.  
Ship building.  
Textiles, and so forth.

E. The contributions of other nations to our welfare :

Canada.  
Mexico.  
South America.  
England.  
France.  
Germany.  
Cuba.  
Turkey.  
Japan.  
China, and others.

### III. Method :

Keep the instruction close to the experience of the pupil. Show the purpose of this course in the introductory discussion unit. Stress the industries which directly affect Colorado above those which do not. Sugar plays a far more important part with us than shell fisheries, and consequently its study will be of more interest and benefit to the pupil. Place special emphasis on the social side of this course. It offers a rich opportunity to show how man is dependent on man and on physical geography, place geography, industry, and so forth. The pupil may be given a real outlook on the importance of knowledge of this kind in business or social life. Moving pictures and slides are available for many of these topics, and are invaluable teaching aids. Good speakers also should be brought in.

### IV. Tests :

Tests should be devised to measure knowledge of content and ability to apply principles to new situations. Papers and reports on industries offer a good means of determining whether the pupil has the ability to apply the principles. This course lends itself to tests of standard types; such as, true-false, completion, and recognition.

**V. Standards:**

Tentative standards will be: a thorough knowledge of the influence of physical geography upon Colorado growth, as shown by the outline; ability to list and locate, and give the importance of, Colorado industries and products; ability to name large industries of other sections as shown in the outline; a good conception of the interdependence of peoples; ability to name the chief contributions of other nations to our welfare.

**VI. Equipment:**

Maps and globes should be provided for all rooms. They should show resources, industries, routes of trade, and other important items. A good map of Colorado, showing these things is essential. Some good books on travel—one or two of the best for each country—United States Department of Agriculture reports, and other sources of information should be provided. Booklets and reports concerning Colorado industries and resources should be filed or placed in the library for future reference.

**VII. Bibliography:**

Goode, John Paul: Series of Base Maps and Graphy. Chicago, University of Chicago Press.

Huntington, Ellsworth: Civilization and Climate. Yale University Press, New Haven, Connecticut, 1922.

Keir, Malcolm: Industrial Organization. Ronald Press Co., New York, 1923.

Smith, Joseph Russell: Commerce and Industry. Henry Holt and Co.

**STENOGRAPHY I.****I. Aims:**

A. To acquaint the pupil thoroughly with related subjects that are necessary to stenographic success so he may have a definite idea as to whether he is fitted for the work.

B. To develop in the pupil the habit of writing words as they are pronounced.

C. To develop a style of penmanship that will enable a pupil to write for sustained periods and to record accurately characters whose only difference is in length, or size.

D. To so establish the principles by drill and review that they will function when new matter is given.

E. To develop the ability to read without hesitation.

F. To drill on word signs until the pupils can write them in any order and use them in sentences without hesitation.

G. To build on word signs until the pupils can write them.

H. To build the ideals and attitudes necessary to success in this work.

## II. Content:

A. Related qualities necessary for success in stenographic work. Use as discussion units.

1. Ability to spell—words must be spelled right.
2. A sense of language—to know whether a statement is sensible and properly stated.
3. Knowledge of punctuation as used in business correspondence.
4. Ability to typewrite at a commercial standard.
5. A legible type of penmanship to carry over into shorthand.
6. Vocabulary.

B. The technical content will be determined entirely by the system taught.

## III. Method:

A. General class method:

Give a clear method for home study and prepared work. Work in reading practice as a drill each day. Have the members of the class cover the longhand and read the shorthand. When the reading is done dictate the words to the pupils slowly and have them write the shorthand. Have the pupils check the work for errors, it is a good plan to have them exchange papers with other pupils but for the most part the checking should be done on their own papers.

A part of the time should be given over to dictation and transcription of notes. Plenty of time must be provided for work on new and old matter in order to test skill and knowledge attainment.

As Gregg is used entirely by the schools in the State of Colorado, a detailed statement of method is given for this system.

B. Method for Gregg content:

Present the forward characters. Drill on them with two ideas in mind: To fix them for the pupil so he can hear and write them from sound, and to develop a skill and accuracy in writing them that will function when new matter is given. This means

that each day for at least four months short periods of penmanship drill should be given for these characters and all others which tend to give any trouble. Good penmanship manuals are available and the drills should not cease until the results carry over into the work when the pupil is not conscious of penmanship of the shorthand kind as an aim.

Present the circle vowels in such a way that prevents the possibility of any pupil not being able to hear and say the sounds. Hearing them is stressed above saying them.

In order to master the joining of vowels and consonants, fix the rules governing them. Each time a word is pronounced, written or read back ask for the rule governing that particular word: circles outside of angles, inside curves, and so forth. Bring up new words.

Spelling by sound, reading back, and giving the rules should be continued through every lesson. With each new lesson review the one just studied. At the completion of each lesson give a fifty word test of words from the manual followed by a hundred word test of new words. A satisfactory mark should be ninety. Do not consider the covering of the words in the manual as the standard of attainment but rather a thorough mastery of the principles brought out in the lesson.

Lessons III and IV present the o and oo vowel groups. Keep the hooks narrow and deep. The o hook is made with the anti-clockwise motion and that it opens at the top. If it is before n, m, r, l, it opens to the right, unless preceded by a down-stroke. The oo hook is made with the clockwise motion and opens at the bottom. If it is after n, m, or between k, g, and r, l, it opens to the left.

At the beginning of a word w is represented by the oo hook while if it is in the middle of the word, a horizontal dash placed beneath the following vowel is used.

Y is represented by the e circle.

Lesson V. In making the s stroke, be sure to keep it short. Keep the th stroke short. Nk is longer than ng because nk has the sound of ngk. Emphasize the time saved by using the prefixes and suffixes.

Before presenting the sixth lesson, familiarize the pupil with u, ow, oi; with ia, ea, ie. In reading back, have them carefully pronounce the diphthongs and vowel combinations as they are sounded.

In taking up the lesson VII on blends teach how the blends are formed. They are combinations of two or more strokes yet they should be thought of as one stroke. Care should be taken to keep the short blends about the length of p, and the long blends the length of b. Closing them up closely at the beginning and end. Make the straight blends long and ses very short. The disjoined t is used for ed only after a blend, as in printed and audited.

In lesson VIII learn thoroughly the joinings at which the circle is reversed. It is the r following the circle that is represented, that the circle is always traced with the left or counter-clockwise motion, although every counter-clockwise circle does not add r. Avoid making the reverse circle into a loop, be sure to close up the circle.

Lesson IX. The most important of all the words to be memorized are the word signs. A word sign half-learned is a positive hindrance. They must be learned so that they can be written and read without the slightest hesitation.

Lesson X. The compounds are an extension of the wordsigns given in the last lesson. They should be thoroughly memorized.

Lesson XI. The principle of phrasing is designed to eliminate pen lifts, and this is a highly important principle. The shorthand phrase should be a natural, grammatical one. Learn to think of the word group as a single outline.

Lesson XII. This lesson completes the omission principles and there are three features about vowel omission that should be considered carefully.

1. What is the vowel that is omitted?
2. What is the joining at which the omission is made?
3. Is the omission always made, or, must discretion be used?

Lesson XIII. Teach all the prefixes in a way that insures the pupil the ability to say and hear the prefixes; hearing is more important than saying, but the pronouncing is an aid.

Lesson XIV. Refresh the pupil's memory as to the vowels, a, e, i, o, u. Then stress that in the tr principle a vowel always follows the tr and the prefix is disjoined. There are of course some exceptions to this. The first letter following the vowel is the first letter to write after the prefix as, matron. The same idea can be followed in writing compound disjoined prefixes.



Lesson XV. Have the pupils memorize the prefixes regardless of the rest of the words. Pay special attention to their position.

Lesson XVI, XVII, XVIII. Proceed as in teaching prefixes. Have pupils memorize the suffixes er, er, ment, position, ute, and so forth. Then give as many groups of words containing suffixes as possible. A thorough review of prefixes, simple and compound, joined and disjoined should be given.

Lesson XIX. In the lesson on phrase writing, practice is the supreme requisite. Collect all material possible to bring these phrases into play, until by the constant writing of phrases they become entirely automatic.

Lesson XX. Vocabulary drill also requires a great deal of practice. Give one hundred word tests; give out mimeographed copies and have the pupil fill in shorthand outline several times, checking and correcting all errors.

**Tests:** Tests for the units in this work should be of two kinds; one to determine the knowledge attainment, and one to determine the skill attainment. A study of the Hoke tests is valuable and also test by Ethel A. Rollinson and may be obtained from the Gregg Publishing Company. The Blackstone tests are also available.

**Standards:** Tentative standards should be normal accomplishment as determined by the Hoke tests in reading, writing, and vocabulary.

The Gregg Transcription tests for a speed of eighty words a minute could be used. Also the O. A. G. test of the Gregg Writer for writing standard.

### Bibliography

Gregg, John Robert: The Teaching of Shorthand, Gregg Publishing Company, Chicago, 1916. Basic Principles of Gregg Shorthand, 1924; Speed Studies, 1922. Making Shorthand Teaching Effective, 1921. Method of Making Shorthand Dictation Drills, 1921. Shorthand Classics Series, including interesting stories, Alice in Wonderland, Christmas Carol, Hamlet, Legend of Sleepy Hollow, and so forth, written in Shorthand.

Hunter, Alice: Graded Readers, Gregg Publishing Co., 1919.

Rollinson, Ethel A.: Diagnostic Shorthand Tests, Gregg Publishing Company, 1924.



## STENOGRAPHY II

**Aims:**

- A. To review and master the theory of the first year.
- B. To drill for speed and accuracy in note taking.
- C. To build a shorthand vocabulary through the use of simple business letters and articles of practical and ethical value.
- D. To develop reading ability.
- E. To develop the power to carry words and context.
- F. To bring out desirable ideals and attitudes through literature and comparisons with real situations.
- G. To acquaint the pupil with business requirements and standards by means of dictation articles.

**Content:**

- A. Review of manual.
- B. Review of dictation and reading material used to fix principles.
- C. Business letters of practical types as:
  - Letter of application.
  - Letters ordering goods.
  - Letters of introduction.
  - Miscellaneous letters.
  - Personal sales letters.
- D. Articles of practical or ethical value on subjects such as:
  - Punctuality.
  - Savings.
  - Standards of stenographic work.
  - Business forms and their uses.
- C. Well written shorthand material for reading.
- E. Office assignments on:
  - 1. Topics brought in by pupils or teachers.
  - 2. Business of school office.
  - 3. Work of teachers in building.
  - 4. Half-day work in business offices.
  - 5. Saturday work in business offices.
- F. Written or typewritten transcripts, typewritten preferred.

**Method:** In the review stress the difficult parts of lessons. Have pupils do the major part of the checking. Have spelling errors checked and penalize them.

When the review is finished devote more time to articles

written in shorthand than to matter that is new. As the class proceeds use more new material.

Gradually increase the speed in dictation. The speed should not be much in excess of the ability of the pupil for it lends to discouragement. Work should be arranged for the slower pupils while the faster dictation is going on. Skill and speed will come with practice. Accuracy should be stressed above speed. All work should be transcribed on the typewriter if possible. Teachers and pupils should cooperate in making out a program for section E. This work is of vast importance but no one scheme will work for all pupils and all schools. Some pupils will have the required high school work well enough completed to work on the part-time plan; some will not. Some schools are so far from business that part-time work has a doubtful value on account of the time required in getting to and from places of work.

**Tests:** Use the tests already referred to with the addition of the Thurstone test for stenographic proficiency. Test material for dictation should include both solid matter and letters.

**Standards:** Normal attainment in the elements measured by the tests previously mentioned should be considered as a standard. One hundred words a minute for five minutes accurately and neatly transcribed is a normal attainment at the completion of the course.

**Equipment:** Individual desks or tables with a good writing surface are necessary to good shorthand work. There should be filing space for transcription work. Typewriters should be furnished for daily transcription.

### Bibliography

Gregg, John R.: *Obstacles to the Attainment of Speed in Shorthand*. Gregg Publishing Co., 1921.

So Relle, R. P. and Gregg, J. R.: *Secretarial Dictation*. Gregg Publishing Co., 1923.

Hoke, E. R.: *Measurement of Achievement in Shorthand*. John Hopkins, 1922.

Blackstone, P. G.: *Stenographic Proficiency Test*. World Book Company.

## TYPEWRITING II

**I. Aims:**

- A. To provide work of a business type to which the pupil may apply the principles and skills of the first half-year.
- B. To teach the names and uses of the parts of the machine to be introduced during this semester.
- C. To stress business letters—parts, form, punctuation, arrangement, content, and so forth.
- D. To stress tabulating until the pupil can tabulate with ease and accuracy.
- E. To master the figures.
- F. To further inculcate ideals of neatness, honesty, and responsibility in typewritten work.

**II. Content:**

- A. Machine part to be taught.
  1. Variable line gauge.
  2. Paper guide.
  3. Paper fingers.
  4. Cylinder knobs.
  5. Tabulator stops.
  6. Tabulator keys—for paragraphing and all other uses.
  7. Ribbon reverse.
  8. Ribbon indicator.
  9. Ribbon spool.
  10. Stencil lever.
  11. Ribbon carrier.
- B. Business letters:
  1. Purposes. (Stress different kinds for different purposes).
  2. Value in business world.
  3. Parts.
    - a. Heading.
    - b. Date line.
    - c. Inside address.
    - d. Salutation.
    - e. Body.
    - f. Complimentary closing.
    - g. Signature.
    - h. Dictator's initials.
    - i. Stenographer's initials.

4. Type :
    - a. Conventional or indention form.
    - b. Block form.
    - c. Block form with exception of complimentary closing.
    - d. Blocked heading and address, conventional body, and complimentary closing.
  5. Punctuation :
    - a. Open.
    - b. Closed.
  6. Envelopes :
    - a. One for each letter.
    - b. Of corresponding type.
- C. Carbons :
1. Care of carbon sheets.
  2. Proper manner of insertion and withdrawal.
  3. Number of copies that can be made.
  4. Touch required.
  5. Use of clips to prevent slipping when using stiff forms.
  6. Use of piece of paper folded over all sheets when inserting.
  7. Correction of carbon copies.
- D. Telegrams, postal cards, and other typewritten business forms.
- E. Tabulation :
1. Centering.
  2. Importance of tabulated form to present figure work in a clear way.
  3. Tabulated arrangement to avoid crowding.
  4. Main headings.
  5. Column headings.
  6. Billing. (Stress).
    - a. Extensions.
    - b. Class unison drills on short and long itemized statements.
    - c. Special signs used in billing work.
  7. Rough drafts. (Do not stress at this time).
  8. Speed figure drills.

### III. Method :

In teaching parts of the machine most teachers bring in their names and uses as the work demands their explanation. Others

drill on the names and uses for consecutive periods. Some give class instruction and then check with individuals. Changing ribbons and oiling must be largely a matter of individual instruction. Tabulator keys, stops, and the like, may be best taught by the class method and drill should be used to fix the principles.

Business letters should be studied by the class as a whole. The theory may be assigned for home study, to be followed by class discussion. It is more important in this semester to fix the principles of writing business letters than to try to develop a high degree of skill in copying forms. However, enough forms should be used to fix the principles. Giving new letters of each type to be arranged is helpful in the way of testing the pupil's ability to apply the principles he has learned.

Tabulation work has too often been taught by the copy method. Some work from copy rightfully belongs in the course but the best growth is attained by class drills graduated from extremely easy to fairly difficult material. Billing exercises may well be used for speed and accuracy drills after a fair degree of skill has been developed. Billing should be stressed. Figure work has been dwelt upon in the above outline but too much emphasis cannot be laid on getting the pupil to use the figure row of keys without hesitation. Dictation work will help develop the ability to carry figures.

The work of this half lends itself especially well to the development of ideals in accuracy, neatness, honesty, and responsibility as applied to typewritten work. It is also easy to make comparisons with the standards of business houses.

#### **IV. Tests:**

The tests should be constructed to determine both mastery of principles and progress in skills. The first type will need to be constructed as no good ones have yet been made available. The Blackstone tests will help decidedly in the measurement of skills.

#### **V. Tentative Standards Will Be:**

##### **A. Thorough knowledge of:**

1. The machine, its parts and their uses.
2. The form of business letters.
3. The construction of business letters as shown by Cody.
4. Use of carbon.



**B. Attainment :**

1. Of score equivalent to 148 as represented by the Blackstone tests.
2. On the figures equivalent to the above score based on 4 strokes to a word instead of 5.6.

**I. Aims :**

- A. To master business forms and letters.
- B. To develop an ability to apply the principles involved in new matter.
- C. To develop an artistic sense of arrangement and an appreciation of the beauty of a typewritten page.
- D. To teach the use of carbons and the different methods of filing them.
- E. To develop concentration and speed in typewritten work. (Stress).
- F. To teach the cutting of stencils and the use of the mimeograph.
- G. To aid the pupils in becoming skilled, efficient, operators of their machines:
  1. By constantly correcting improper fingering or posture.
  2. By stressing proper manipulation even in the detailed points of operation.
- H. To further develop in the pupil a desire to assume responsibility for a piece of work and to answer for its accuracy.

**II. Content :**

Note.—All the principles should be covered the first half-year and pupils who measure up to a commercial standard should not be required to take the second half. For those desiring more work and those not up to standard, special exercises and drills should be given in the second semester in order to attain the standard. The same kinds of material may be used as are in this outline.

**A. Introduction of legal forms :**

1. Affidavits.
2. Testimonies.
3. Wills.
4. Mortgages.
5. Leases.



## B. Form letters:

Filling in.

## C. Dictation to the machine.

## D. Rapid addressing of envelopes.

## E. Rough drafts. (Stress.)

## F. Printer's copies.

These can be handled in connection with school papers, annuals, and so forth.

## G. Alphabetizing, spelling, syllabication, and punctuation. (Stress):

1. These can be taught through the dictation of exercises to the pupils at their typewriters.

2. Some text on business English should supplement this work and be used for reference.

## H. Civil Service:

1. Its possibilities.

2. Training.

If there are any who plan to take the Civil Service Examinations, special training should be given. Trial tests are given in the typewriting manuals. Other materials may be obtained from the postoffice.

## I. The uses of carbons.

## J. The Correct use of an eraser. (Stress).

## K. Practice in the composition and typing of letters useful to the student. (Stress):

1. When he answers an advertisement for a position.

2. If he wishes to send a subscription to a magazine.

3. When he orders articles by mail, and so forth.

## L. Speed. (Stress):

1. Speed sentences.

2. Ten, fifteen, and twenty minute contests.

## M. Office work of the school. (Stress).

(To give an opportunity to apply principles learned and to develop responsibility).

An advanced class can be of real service to the school by arranging and typing material required by the office, by teachers, by clubs, and various organizations. This will give varied practice in style and arrangement in typing:

Programs.  
Lists of members.  
Articles for bulletin boards.  
Library notices.  
Roles for plays.

### III. Method:

Office work can be checked and the pupil credited with it as he is with daily work. The pupil's knowledge that his work is going out of the classroom will aid him in developing responsibility through the realization that he must send out the best of which he is capable. For the work that is to go out into the school set up this ideal:

"Here is a piece of work. You are to do it to the best of your ability and when you hand it in it should be correct."

Systematic handling of this work relieves the secretaries, the librarians, and the teachers, of work which to them is mechanical.

It leaves them more time for class and research work.

The teacher's time in the office work should be given to guidance and advice on matters of arrangement, form, neatness, and other things of like character.

The work for each week should be carefully planned to meet some definite aim and the major part of the material given should be so chosen. If the unit to be studied is alphabetizing, the exercises provided should be mainly for that purpose. Enough variety should be worked into each week to keep the pupil from finding the work monotonous. Many use a system that calls for three days work from a text chosen to develop that principle in mind, and two days for office or school work and competitive tests.

Time may be well spent on speed tests and accuracy tests until the desired standards are attained in skill; then the larger part of the week should be devoted to subject matter content with two days to office or school work and speed and accuracy drill. Any procedure should include:

1. Drills for speed and accuracy.
2. A plan for subject matter study; exercises and drills to fix the principles studied.
3. Enough outside work to develop a sense of responsibility for a good piece of work.

Each pupil should receive instruction in all phases of the work—the class should be taught by the class method.

Two ways are used to free the teachers from paper checking. One is to have pupil assistants. The other is to develop in the class the idea that making an error is not so important as not finding it and setting before the class the standards by which work is judged and asking them to do the judging. Pupils may correct their own papers one day and have different neighboring pupils check them the other days of the week. This provides all the benefits of other checking methods and allows the teacher who can develop ideals to aid materially in pupil growth in them.

Mimeographing is one of the best means of teaching accuracy and neatness, and of developing pride and responsibility in an assigned task.

#### **IV. Tests:**

Tests should be for different purposes.\* Some should be designed to test subject matter and may be of the type of the question, problem, true-false, completion, or other. Some problem tests may well be used for arrangement, punctuation, and so forth. Still tests for speed and accuracy have long been used. The tests sent out by the typewriter companies are good and the Blackstone tests will be of great help. Neither of these types tests to any great extent for ability to use figures.

Awards for good typewriting are offered by the L. C. Smith, Remington, Underwood, and Royal Typewriter companies. These companies send out material monthly for the use of the students. While the tests are called speed tests, they are really accuracy tests as any errors are heavily penalized. Some of the awards offered are: certificates, card cases, medals, pins, pencils, pens, and even typewriters. The actual time required to give the tests varies from ten to fifteen minutes and only one test a month can be written for any one company. Interested pupils will be glad to put in their own time practicing and to check their own papers.

#### **V. Standards:**

At the end of the first half of this year the pupil should be able: to properly construct and arrange business letters and rough drafts, to arrange tabulated matter and write figures at a commercial speed—at least half as fast as other matter; to cut stencils; to use legal forms specified in the outline; to punctuate properly; to divide syllables properly; to attain a standard in skill equal to that of a score of 178 on the Blackstone tests.

Those who meet the above standards and attain a skill score of 200 on the Blackstone tests, at the end of the first half-year

should not be required to take more typewriting work as the drill incidental to secretarial practice and dictation will serve to keep up the speed. Those who do not should take the second half-year in order to meet these standards.

Too much emphasis must not be placed on tests of the skill type, represented by plain copy or letter copy, in setting up standards. It is far more important for a pupil to be able to take new matter, put it in proper form, and answer for its neatness and correctness than it is for him to be able to write sixty words per minute on a ten-minute speed test. The final judgments of the pupil will be based upon his ability to do work of a commercial standard for sustained periods.

## VI. Equipment:

Fifteen to twenty-five machines of different standard makes are suggested for the second year typewriting rooms. Pupils may then be shifted around so that at the end of a semester they are able to know and operate all standard makes.

A mimeograph should be available.

(See also equipment in outline for typewriting I).

## VII. Bibliography:

So Relle, R. P.: *The New Rational Typewriting*. Gregg Publishing Co., 1919.

Adams, Elizabeth Starbuck: *Junior Typewriter*. Gregg Publishing Co., 1922.

Owen, Margaret: *The Secret of Typewriting Speed*. Forbes, 1917.

So Relle, R. P.: *Methods of Teaching Typewriting*. Gregg, 1919.

Crosier, A. B.: *Mental Control Through Rhythmical Influence in the Learning of Typewriting*. Gregg, 1921.

Hokes, Adelaide B.: *Typewriting Speed Studies*.

Harned, William E.: *Typewriting Studies*.

Fritz and Eldridge: *Essentials of Expert Typewriting*.

Holzinger, Marion Stone: *Fundamentals of Business English*. (For references concerning business letters see outline on business English).

Public School Messenger, Board of Education, St. Louis, Missouri, November, 1924.

Public School Messenger, Board of Education, St. Louis, Missouri, May, 1924.

## BUSINESS ENGLISH

**I. Aims:**

- A. To give practice in organizing and presenting materials for both oral and written work.
- B. To stress, in both business talks and correspondence, the importance of adapting the subject matter to the particular purpose in mind.
- C. To establish the habit of reading business and industrial literature through the use of current periodicals.
- D. To develop ability in oral expression.
- E. To correct errors in fundamentals of grammar.

**II. Content:****A. Organization of material:**

1. Deciding upon the aims in mind and the ends to be attained.
2. Finding sources of information.
3. Collecting data.
4. Eliminating unnecessary and irrelevant matter with conscious attention given to:  
Unity, Interest, Appeal, Fitness for the occasion.
5. Arranging ideas in the best order.
6. Presenting the material.

**B. Suggestive topics for practice in organizing and presenting oral and written material:**

1. How to organize a good football rally.
2. How to arrange for a student council election.
3. How to preside at a meeting.
4. How to send money by mail.
5. How to use the dictionary.
6. Application for a position—pupil as applicant teacher as employment manager.
7. Points by which the applicant is judged:
  - a. Use of English.
  - b. Personal appearance.
  - c. Education.
  - d. Habits.
  - e. Character.
  - f. Knowledge of the job.
  - g. Voice.
  - h. Personality.



## C. Business letters:

## 1. Mechanics of the business letter:

## a. Stationary.

- (1) Paper—quality, size, letterhead, second sheets, and so forth.
- (2) Envelope—sizes, kinds (window, standard, and others).

## b. Form.

- (1) Block.
- (2) Indention.
- (3) Obdention.
- (4) Mixed.
- (5) Margins and spacing.

## c. Parts.

- (1) Heading.
- (2) Date.
- (3) Inside address.
- (4) Salutation.
- (5) Body—paragraphing and arrangement of subject matter.
- (6) Complimentary close.
- (7) Signatures.
- (8) Initials.
- (9) Inclosures.

## d. Preparing for mailing.

- (1) Addressing envelope.
- (2) Special data; in care of; return address.
- (3) Folding.
- (4) Sealing.
- (5) Amount of postage.
- (6) When to mail.

## 2. Kinds of business letters:

## a. (1) For job.

- (2) In answer to an advertisement.
- (3) To apply for a scholarship.

## b. Letters of recommendation

(have pupils recommend other pupils for positions).

## c. Letters of inquiry.

## d. Letters introducing some one.

## e. Letters making appointments.



- f. Letters giving information.
  - g. Letters of instruction to workmen or salesmen.
  - h. Order for goods.
  - j. Acknowledgement.
  - k. Sales letters.
  - l. Collection letters.
- D. Other forms of business communication:
- 1. Telephone (use for an oral discussion unit).
    - a. Its importance in business.
    - b. How to use it.
    - c. Telephone directory and its uses.
    - d. Long distance.
    - e. Taking messages.
    - f. Telephone courtesy.
    - g. Care of phone.
    - h. Private branch exchanges.
    - i. O. K. telephone.
- E. Fundamental knowledges to be stressed in all written work, and to be drilled upon until they function:
- 1. Spelling.
  - 2. Capitalization.
  - 3. Syllabication.
  - 4. Abbreviations and contractions.
  - 5. Simple punctuation.
  - 6. Paragraphing.
  - 7. Ability to express one's ideas simply and directly.
  - 8. Elimination of common errors.
- F. Operating office machines. Arrange for demonstrations of special machines:
- 1. Mimeographs.
  - 2. Adding machines.
  - 3. Rubber stamps.
  - 4. Check protectors.
  - 5. Numbering machines.
  - 6. Copy holders.
- G. Practice assignments. (Stress).
- 1. Brought in by teachers or pupils.
  - 2. In school office.
  - 3. Work for teachers in building.
  - 4. Half-day work in business offices.
  - 5. Saturday work in business offices.

### III. Method:

Two methods of organization of classes present themselves. One is to have separate classes for general business and accounting, stenographic, and sales pupils. This is the better way, for then a specialized type of training best suited to the needs of the whole group can be given. If in any school it is not possible to so group them and the class should be made up of all kinds of pupils the following diversified interests should be kept in mind, and a three-track system worked out which will direct the work of the various groups along these lines.

#### A. General business and accounting:

1. Work to be more of a written and analytical character.
2. Statements and reports to be stressed.
3. Pupils should drill on analysis of various financial statements.
4. Explanations and reports concerning the duties of bookkeepers and others engaged in the management of business.
5. Advantages of jobs, remuneration, promotional possibilities, and other things concerning workers in this field.
6. Explanations of simple cost accounting systems.
7. Study and discussion of business ethics and policies of representative firms.
8. Other topics which concern this type.

#### B. Stenographic:

1. Stress both content and form.
2. More attention needs to be directed to written work in this division than in the others.
3. Importance of being able to meet people and to carry on a conversation should not be forgotten.
4. Train for responsibility in analysis of thought and meaning in business correspondence.
5. Reports should be given on duties of stenographers, advantages and disadvantages of positions, remuneration, promotional possibilities and other like topics.
6. Discuss other types of office positions, such as those of private branch exchange operators, file clerks, and

comptometer operators, where some knowledge of stenography is usually necessary but the other types of training enhance the possibilities for promotion.

7. Have reports on personal qualities necessary for the office girl; such as, tact, patience, personal appearance, knowledge of business, efficiency, personality.
8. Business ethics and policies of representative firms should be used as topics for reports.
9. Stress importance of spelling, punctuation, syllabication, and other points from technical grammar.
10. In handling business letters many teachers like to have the pupils write to each other and the proper answers prepared. Emphasis should be laid on what is said as well as upon the form. An appreciation should be developed for the purposes of letters and the importance of fitting thought and language to the purpose. Each pupil should receive several sales letters and should answer only those making a strong appeal. Telegrams, cablegrams, and other like forms can be worked in with letters ordering goods and letters of confirmation.

#### **IV. Tests:**

Inventory tests should be used to determine the fundamentals which are to receive special stress. They may well take the form of exercises involving the use of nouns, pronouns, adjectives, and other parts of speech; or be true-false or recognition tests involving common errors; or be of a completion type.

Good tests should be worked out for the subject matter of each unit. Sample tests in spelling, grammar, punctuation, and letter writing are given in the book, *Commercial Tests and How to Use Them*, by Sherwin Cody, World Book Company, N. Y., 1920. They may be used in this work and should offer suggestions to teachers for constructing others.

#### **V. Standards:**

Tentative standards will be:

Ability to pass the fundamentals and letter writing tests as outlined by Cody with an attainment equal to that given as the average for high school graduates, or the equivalent on tests of life nature. Stenographic pupils should be drilled until they exceed these standards.

Ability to organize material and present it in different ways which emphasize display and form features.

Ability to express thoughts orally without hesitation and embarrassment. (To be especially emphasized for retail selling pupils).

## **VI. Equipment:**

A good set of reference books, directories, magazines, business letters, advertisements, reports, and business forms should be provided.

Pupils of each class should collect new materials to be filed for future use. If the library does not take care of them, a filing cabinet should be obtained and the files kept up to date. Good business letters, forms, and reports should be used for comparison with pupil's work.

## **VII. Bibliography:**

Bartholomew, Wallace Edgar and Hurlbut, Floyd: *The Business Man's English*. Macmillan Company, N. Y., 1923.

Buhlig, Rose: *Business English*. D. C. Heath and Company, Boston, 1921.

Commercial Education Research Committee Report, *English and Business*, New York, Board of Education Report, 1923.

Dolch, E. W.: *Manual of Business Letter Writing*. Ronald Press Co., 1922.

Hatfield, W. W.: *Manual of Business Letter Projects*. Macmillan Company, N. Y., 1921.

Jones, Conner Thorne: *Teaching Business Subjects in the Secondary School*. Ronald Press Co., N. Y., 1924.

Ross, J. W.: *Business English*. Southwestern Publishing Co., Cincinnati, 1923.

Gardner, Edward Hall: *Effective Business Letters*. Ronald Press Co., N. Y.

## BOOKKEEPING I

**I. Aims:**

- A. To give as clear a picture as possible of the kinds of business, and of their organization and operation.
- B. To teach the analysis and preparation of simple financial statements.
- C. To teach the theory and use of some of the fundamental accounts.
- D. To drill on the principles of arithmetic involved in the elements of simple bookkeeping.
- E. To teach the theory and application of books of original entry.
- F. To develop the records peculiarly applicable to the sole proprietorship type of business organization.
- G. To bring out the value of systematic records as being the source of information necessary to the proprietor.
- H. To teach the adjusting and closing of the books at the end of the fiscal period, the journal method being used.

**II. Content:****A. Study of business:**

The study of business may be best approached by a series of suggestive questions, as they will open the subject to the pupil and bring about a general discussion.

1. Name several types of business organizations and a suitable location for each.
2. What is a commercial organization?
3. What is a financial organization?
4. Distinguish between the two types.
5. Name and give location of several examples of each.

**B. Organization of business:**

1. Is an investment essential in organizing a business?
2. If you were starting in business, what investments other than cash could you put into it?
3. If you were to organize a business, what kind of employees should you most desire?  
(Stress this section and consider it thoroughly from the standpoint of both employer and employee).
4. Name some of the equipment necessary to begin a business.



## C. Operation of business :

1. What is the mutual relationship between a business organization and a bank?
2. How does a business organization place its funds in the bank for safe-keeping?
3. For what purpose is this fund used?
4. Is it necessary to buy and sell in order to carry on a business organization? Support your answer by examples.
5. Are expenses essential in the operation of business?
6. Give nature of some of the essential expenses.
7. Do expenses increase or decrease the proprietorship?
8. Why do some business organizations succeed, others fail?
9. Would written records assist in operating a business?
10. What written records would be most helpful?
11. What information do these records give the owner?
12. How may this information be used?
13. How could a proprietor determine the amount of sales?
14. How could a proprietor determine the cash receipts, the cash payments, the cash on hand?

## D. Elements of business :

1. Values owned :
  - a. The proprietor is interested to know the money value of property owned by his business; such as, his cash balance, merchandise in stock, delivery equipment, amounts due from customers, office supplies, and so forth.
  - b. Values owned and used by the proprietor in the operation of his business are known as assets in bookkeeping.
2. Values owned :
  - a. The proprietor should also know the claims against the money values owned; such as, the amount due others.
  - b. Such values are known as liabilities in bookkeeping.
3. Present worth :
  - a. Knowing the money value of what he owns and what he owes, the proprietor is able to determine his present worth. That which the proprietor owns less that



which he owes is called his present worth or proprietorship. If at any time the total liabilities should exceed the total assets the business is said to be insolvent.

#### E. Balance sheet:

Due to his many duties—duties which deal with the general management of the business—the proprietor desires the information put in such form that it can be obtained very readily. He wishes to know the relation of assets, liabilities, and proprietorships; whether his assets have increased or decreased in proportion to his liabilities; what his net worth is; and any other information concerning his financial standing. This information he receives in the form of a report called the balance sheet, which is a statement of the business showing a list of the proprietor's assets and liabilities or what he owes.

##### 1. Purpose:

- a. The balance sheet enables the proprietor to see whether he has added to his original investment, and by comparing the balance sheets of different periods he can plan for the future of the business.
- b. It also enables the proprietor to know his credit standing. This is of value to him in case he desires to borrow.

##### 2. Content and form:

- a. The report form gives the necessary information to the proprietor more readily than other forms. This form shows three distinct parts: assets, liabilities, and proprietorship.
- b. The assets are listed in the order in which they can more readily be converted into cash; as, cash, notes receivable, accounts receivable, merchandise, and other inventories.
- c. The liabilities are listed in the order in which the accounts must be paid: notes payable and accounts payable.
- d. Proprietorship, or the third part of the balance sheet shows the ownership at the time the statement is made. To determine the proprietorship or net worth, subtract the total liabilities from the total assets.

- e. The following equation illustrates this principle: assets—liabilities—proprietorship.

Suggestion for class work:

Sufficient drill should be given to enable the pupil to see the relation between the parts of the statement and to interpret it. Only such assets as cash, amounts due from customers, merchandise on hand, furniture and fixtures, and such liabilities as amounts due to creditors, should be considered at this point.

F. Profit and loss statement:

Books are kept for the purpose of recording transactions and as a basis for the preparation of statements. Every business has certain accounts which indicate a profit or an expense.

1. Purpose:

- a. To show the amounts and sources of all profits and expenses, including the gross profit on sales, the object being to find the net profit or the net loss for the period.
- b. To show the result of past operations.
- c. To aid the proprietor in planning for the future.

2. Content:

In discussing the content of the profit and loss statement, the meaning of each item in the statement should be taken up, not in the order in which it appears on the report, but as it enters into the conduct of the business.

- a. Purchase; that is, goods bought to be sold at a profit.
- b. Sales:
  - (1) After goods have been bought, marked, and placed in stock, they are ready to be sold. The amount sold during a fiscal period consists of the sales of that period.
  - (2) Goods are sold at a higher price than that at which they are bought, thus bringing a profit to a well-managed business.
- c. Merchandise inventory:
  - (1) The merchandise on hand at the time the financial statement is made is called the merchandise

inventory. It is determined by actually counting every article, valuing it at the cost price.

d. Cost of goods sold:

- (1) By subtracting the amount of goods on hand from the total purchases of the fiscal period, plus the merchandise on hand at the beginning of the fiscal period, the result is the cost of the goods sold.

e. Gross profit:

- (1) Knowing the cost of the goods sold and the net sales for the period, the manager has the information to determine his gross profit. This is obtained by subtracting the cost of goods from the net sales.

f. Expenses:

- (1) In the conduct of the business there are always certain unavoidable expenses which arise. These are merely a part of the regular operations of the business.

g. Net profit:

- (1) Although the manager is interested in his gross profit, he is more interested in his net profit, as it gives him more information and shows the result of past operations. Net profit is determined by subtracting total expenses from gross profit.

4. Form:

The form of the profit and loss statement should be such as to give quickly to the manager the necessary information for the control of his business. In order to do this it should contain all items in totals.

The profit and loss statement consists of two sections:

a. Trading section—containing the following items:

Merchandise purchases, sales, merchandise inventories (opening and closing), and cost of goods sold, from which information the gross profit or loss is derived.

b. Operating expense section—which deals with the operating expenses, the total of which subtracted

from the gross profit or loss determines the net profit or loss.

G. Accounts:

1. Purpose:

- a. To have available in convenient form the information needed for fiscal reports.
- b. To give means of knowing the amount due from customers, due to creditors, amount of expenses, and so forth.

2. Nature and arrangement of the account:

- a. The title should indicate clearly the content of the account.
- b. The account should have two parts: the left-hand side or debit side in which the values received are recorded; the right-hand side or credit side, in which the values parted with are received.

3. Content:

- a. Entries made in the account as a result of the performance of transactions.
- b. Analysis of transactions, showing how they consist of exchanges of values.
- c. The relation of the terms debit and credit to the two sides of the account and to the recording of transactions.
- d. The quality of debits and credits.

4. Suggestions:

1. Drill on analysis of transactions.
2. Drill on meaning of account balances and their relation to the financial statements.
3. Here the purpose is to develop a clear understanding of the facts to be recorded and their effect upon the financial condition of the business.
4. The student should think of:
  - a. The transaction to be recorded.
  - b. The effect of this transaction on the financial condition of the business as shown by the balance sheet and statement of profit and loss.
  - c. Methods of recording transaction.

5. Construction and interpretation of specific accounts. In taking up the particular accounts, those which the pupils are most familiar should be considered first.

a. Cash account:

- (1) Every pupil is familiar with cash transactions and many have kept a record of cash receipts and cash payments. It is necessary to record the cash received and cash paid so as to be able to offset the two and obtain the cash on hand or cash balance.

b. Purchases account:

- (1) In recording merchandise purchases the value received, or the account debited, is merchandise purchases, and the value parted with, or account credited, is cash paid.

c. Sales account:

- (1) The purpose of the sales account is to show the amount of merchandise sold. The balance of the account shows the net amount of sales during the fiscal period and is shown as the principal item of income on the profit and loss statement.

6. Receipted invoice:

- (a) As receipts are not used as much in modern business practice as formerly, it has become the custom if a creditor renders a bill for which he pays cash, to write or stamp across its face information similar to the following:

Received payment

April 30, 1924.

L. S. Merrac & Co.

Per.....

- (b) At the present time payments are usually made by means of checks, and since the check must be indorsed by the payee before it is cashed, it serves as a receipt.
- (c) If a check is not used in paying an invoice or account, a formal receipt is sometimes used. These are issued from a book with a stub which provides



a permanent record of the information given on each receipt. Note.—At this point the pupil can become familiar with different types of stamps and their values. Give drill on making, filling out, and receipting invoices.

d. Expense accounts:

(1) In every business it is necessary to incur certain expenses in order to carry on the business successfully. It is also necessary to purchase items which are not to be offered for sale, but are used by the business. These items are also considered as expenses. When a particular expense is spoken of, it is called a specific expense; such as,

(a) Rent.

(b) Fuel; as, coal and coke used for heating store, warehouses, offices, and so forth.

(c) Office supplies; such as, stamps, stationery, pencils.

(d) Salary.

(e) Classification of expense:

Expenses are classified as to their function into two general groups known as selling expenses and administrative expenses.

1. Selling expenses:

The selling expense account shows the expenses and amount incurred in the selling of the goods of the business. It is best at this point not to go into detail in regard to these expenses, although mention of the most familiar ones should be made. Salesmen's salaries and commissions, delivery expense (wrapping, shipping room, horse and motor expenses, delivery salaries), and advertising, are some of the selling expenses which could be brought up incidentally.

2. Administrative expenses:

The administrative expense account shows the cost of managing the business; such as, salaries of the proprietor, office employees, the cost of stationery and postage, heat and light, rent, fuel, telephone, and so forth.



### 3. Expense inventories:

It is often found that at the end of the fiscal period there are certain items on hand which are listed under the name of expense. These unused items are assets, as they show that certain supplies are on hand at the beginning of the new fiscal period. In order to obtain the true amount for the profit and loss statement, the expense inventory is subtracted from the total amount in the expense account.

#### e. Capital account:

- (1) On the balance sheet, the difference between the total assets and the total liabilities of the business represents the proprietor's capital in the business. A separate account should be kept with the proprietor to show his original investment, how much he has added to it or withdrawn from it. At the end of the fiscal period the net profit or loss for the period is transferred to the capital account if it is not transferred directly to the personal account, thus showing the true financial standing of the business.

#### f. Proprietor's personal account:

- (1) This account is kept to show minor withdrawals, minor additions, and the result of closing the profit and loss account if not closed directly into the capital account. The balance of this account is transferred to the proprietor's capital account.

### H. The trial balance:

Emphasis has already been placed on the equality of debits and credits. We now take up the method by which this equality is tested at periodical intervals. This equality exists because the recording of the transactions in their respective places under the proper title involves an exchange of equal values.

#### 1. Methods:

There are two methods used to determine the trial balance:

- a. By showing the total debits and total credits of each account.

- b. By showing only the balance of each account. Note.—Emphasize the fact that the trial balance does not prove the accuracy of the entries made—it is merely a device to check clerical error.
2. Suggestions for laboratory work:
  - a. Give individual accounts and have the class prepare them for taking a trial balance.
  - b. Combine the accounts and make a trial balance.
  - c. Show how to arrange the various accounts of the trial balance.
  - d. Show the relation between the arrangement of the accounts of the trial balance and making of a profit and loss statement and balance sheet.

#### I. Laboratory work:

The laboratory work should involve short narrative sets including preceding accounts, trial balance, and statements.

#### J. Journalizing:

Daily transactions are analyzed as to debits and credits and recorded in a book called the journal.

#### K. Posting:

In transferring information from the books of original entry to the ledger care must be taken as to the correct dating, amounts, folio pages, and placing debits on debit side and credits on credit side of the respective accounts.

#### 1. Laboratory work:

Short exercises involving journalizing, posting, trial balance, and financial statements.

#### L. Other accounts:

The accounts studied thus far were developed with business done on a cash basis. Purchases of merchandise and supplies of different kinds were bought for cash. Sales were made on the cash basis only. In almost every business it is likely that merchandise purchases and sales are made with the understanding of paying for them at some future time. This is known as doing business on credit basis, or as the term implies to open an account. The credit basis gives rise for further accounts: such as

#### 1. Accounts receivable:

Customers do not always pay cash for their purchases. A proprietor may extend credit to a good customer, and

the customer promises (verbal promise) to pay at a future date agreed upon between the proprietor and customer. An account is opened on the books under the name of the customer. The balance of the customer's account shows how much he owes the firm and represents an asset.

## 2. Account payable:

This is the account which arises in doing business with creditors on a credit basis. The balance of each account payable will show how much is owed each creditor and will represent a liability.

## 3. Notes receivable:

Often sales are made to customers who give promissory notes in exchange. In recording such a transaction the account notes receivable is debited when a note is received and credited when note is redeemed. The balance of the account will show the notes on hand, and will represent an asset.

### a. Business forms and arithmetic:

Before entering upon the analysis of note transactions, the study of the note proper should be taken up.

Suggestions:

- (1) Form.
- (2) Content.
- (3) Arrangement of content.
- (4) Terms.
  - (a) Maker or drawer.
  - (b) Drawee.
  - (c) Payee.
  - (d) To the order of.
  - (e) Value received.

### (5) How to receipt note:

Much drill should be given in finding the due date of note.

For example:

| Date of Note. | Time.    | Date Due. |
|---------------|----------|-----------|
| April 30      | 60 days  | ?         |
| May 4         | 2 months | ?         |
| Jan. 15, 1924 | 90 days  | ?         |

## 4. Notes payable:

When a proprietor gives instead of an oral promise a written promise to pay his creditors, the account notes payable will be credited when a note is issued and debited when note is redeemed. The balance of the notes payable account shows the amount due on notes and will represent a liability.

## 5. Interest accounts:

In most business the principal transactions with interest are those between the business and the bank from which money is borrowed, although interest-bearing notes may be given by the business to creditors or received from customers. Hence, from the viewpoint of the business, interest may be classified as to:

## a. Interest received account:

The balance of the account is transferred to the profit and loss account, and is usually shown as a non-operating income in the profit and loss statement.

## b. Interest paid account:

The balance of this account is transferred to profit and loss account, and is usually shown in the profit and loss statement as a non-operating expense.

## N. Book of account:

Special journals are used because in every business there are many transactions of the same nature which occur frequently. If they are recorded in special journals, the work of entering and posting them is greatly reduced. Not only is the work of recording and posting reduced, but information can be obtained more easily. Emphasize the nature of each journal and the fact that the equilibrium of debits and credits is maintained in the separate journals as well as in the general journal.

## 1. Cash book:

Suggestions:

- a. Teach the cash book as two separate books, the cash received book and the cash paid book.
- b. Show the relation between the cash receipts journal and the cash disbursement journal and the cash ac-

count; and that the two journals are combined in the cash book.

- c. Show advantages of the use of the cash receipts journal and the cash disbursement journal.
- d. Emphasize the fact that these are but subdivisions of the general journal and that the same principles govern their use and construction.
- e. Show that the equilibrium of debits and credits is maintained in the separate cash journals as well as in the general journal.

## 2. Purchases journal:

- a. Enter all purchase of merchandise.  
Record the
  - (1) Current date and date of invoice.
  - (2) Name of creditor from whom purchased.
  - (3) Address.
  - (4) Terms of invoice.
  - (5) Amount of invoice.
- b. Find the total purchases of merchandise for the period by totaling the amounts of the purchase book.
- c. Post.

## 3. Sales journal:

- a. Enter all sales of merchandise.  
Record the
  - (1) Date.
  - (2) Name of customer.
  - (3) Address.
  - (4) Terms of sale.
  - (5) Amount of the sale.
- b. To find the total sales for the period, total the amounts of the sales book.
- c. Post.

## 4. General journal:

Even though separate journals are used to record cash, purchases of merchandise, and sales, there are certain classes of transactions that are recorded in the general journal.

- a. Opening entries.



- b. Current entries (which are not recorded in a special journal).
- c. Adjusting entries.
- d. Closing entries.

5. Ledger :

The ledger is the book of accounts. The accounts in the ledger should be arranged in the order in which they are used in preparing the statements.

6. Order and method of posting :

- a. Post from purchases journal: credit each personal account and debit total merchandise purchases.
- b. Post from sales journal: debit each personal account and credit total merchandise sales.
- c. Post from cash receipt book: credit accounts and debit totals cash received. Indicate book by letter.
- d. Post from cash paid book: debit accounts and credit total cash paid. Indicate book by letter.
- e. Post from general journal in the usual way; indicate not only folio pages but journal.

Laboratory work :

Using exercises involving the various journals post the transactions; make trial balances and statements.

O. Closing of ledger :

- 1. Explain the purpose.
- 2. Adjusting entries.

At the time the books are closed it is usually found that the ledger does not show the true condition of the business. It is therefore necessary to make adjustments in the ledger by means of journal entries before the ledger can be closed. These adjustments involve mostly the inventories which are on hand.

- a. Suggestive order of adjusting the ledger :
  - (1) Debit purchases account and credit merchandise inventory accounts (opening inventory).
  - (2) Debit merchandise inventory account (closing inventory) and credit purchases account to bring final inventory on to the books.



- (3) Debit merchandise sales account or profit and loss account and credit purchases account to close purchases account.

3. Closing entries:

After the various accounts have been adjusted, the next step is to find the balance of these accounts and transfer these balances into the profit and loss account. The profit and loss account is then closed into the capital account.

4. Post closing trial balance.

P. Working sheet:

1. Purpose.
2. Content.
3. Form.
4. Relation to balance sheet and profit and loss statement.
5. Information available from working sheet.
6. Drill.

Q. Opening entries:

The opening entries may be of two kinds:

1. Simple entry—in which only one debit and one credit are involved.
2. Compound entry—in which one debit and two or more credits; two or more debits and one credit; or two or more debits and two or more credits are involved.

Drill should be given on both types of opening entries.

R. Narrative set:

At this point a practice set, to show the application of the principles discussed in the preceding work, should be taken up.

This set should be planned to include a study of:

- a. Transactions involving two fiscal periods.
- b. Books of account. The transactions will be recorded in the general journal, purchases journal, cash journal, and sales journal, and posted into the general ledger.
- c. Trial balance.
- d. Statements.
- e. Closing books.
- f. Posting closing trial balance.

General suggestive questions :

1. Of what values has this course been to you?
2. Why can it be said that bookkeeping is the foundation of all business principles?
3. Why are personal accounts not closed?
4. Explain the advantages of the different journals.
5. Why is it advisable to keep more than one expense account?

S. Value of bookkeeping :

1. Accurate methods of bookkeeping will help students to keep records of clubs.
2. Pupils receive a general information as to the duties performed in the bookkeeping department.
3. It gives the pupil a general information in the bookkeeping field.

### III. Method :

Suggestions as to method are given all through the content of this unit. The unit is to be used as a basis for courses other than bookkeeping and stress should be laid on developing principles and understanding of business as well as technical bookkeeping skill.

### IV. Tests :

Tests should be designed to determine the skill of making calculations ; others for testing the recording skill ; and other for testing the analytical ability.

### V. Standards :

Tentative standards shall be :

A knowledge of business sufficient to name the different kinds and to picture the organization, administration, and operation of the single proprietorship type.

Ability to list, extend, add and subtract, figure discounts, and perform any other mathematical processes involved in sales and invoices with absolute accuracy. Legible penmanship with fair speed should be kept in mind but not stressed to the extent that it will be in the next semester.

Ability to explain the use of, and to fill out properly invoices, promissory notes, and check.

Ability to interpret and construct the following accounts: cash, purchases, sales, accounts with expense, the proprietor's capital, the proprietor's personal, personal accounts, notes receivable, note payable, interest received and interest paid. Ability to interpret, analyze, and record a series of transactions from a sole proprietorship type business, involving the cash book, the purchase journal, the general journal and the ledger, and to prepare the financial statements and to close the books.

## **VI. Equipment:**

Other than the required furniture and equipment in each room where bookkeeping is taught, there should be a recognized make of listing machines and a filing cabinet of standard size and make.

## **VII. Bibliography:**

Baker, James W.: *Twentieth Century Bookkeeping and Accounting* (complete). Southwestern Publishing Co., 1923.

Finney: *Account Principles and Bookkeeping Methods*. Henry Holt & Co., 1924.

Jones, Conner T.: *Teaching Business Subjects in the Secondary School*. Ronald Press Co., 1924.

Koopman-Kester: *Bookkeeping*. Ronald Press, 1923.

McKinsey, J. O.: *Bookkeeping and Accounting*. Southwestern Publishing Co., 1920.

Rosenkampff-Wallace: *Bookkeeping. Principles and Practice*. Prentice Hall, Inc., 1923.

## BOOKKEEPING II

**I. Aims:**

- A. To study the partnership type of business organization.
- B. To teach the principles of accounting as applied to the partnership type of business organization.
- C. To enable the pupil to prepare and analyze more complicated financial statements.
- D. To familiarize him with the construction and interpretation of more advanced accounts and their classification.
- E. To study and apply books of entry, involving special columns and controlling accounts.
- F. To interpret more complicated financial transactions and adjustment data.

**II. Content:**

- A. Study of the partnership type of business organization.  
Concrete case of partnership, its formation, operation, and dissolution:
  1. Characteristics of the partnership.
  2. Articles of co-partnership.
  3. Opening entries.
  4. Current entries.
  5. Salaries of partners.
  6. Distribution of profits.
- B. The balance sheet:
  1. Additional uses which may be made of the balance sheet.
  2. Additional information which may be shown on the balance sheet; as, the method of calculating and recording the estimated loss on bad debts, additional fixed assets; the method of showing proprietorship in a partnership.
  3. Relation between current assets and current liabilities.
  4. Continued use of the working sheet.
- C. Profit and loss statement:
  1. Additional information in reference to:
    - a. Operating income, the nature of sales deductions, as sales returns and sales allowances.
    - b. Items which affect the cost of goods sold, as deductions and additions to purchases.

- c. Classification of operating expenses; purpose of classification, and the basis on which it is made.
  - d. Non-operating income and non-operating expenses. Note.—Attention should be given to the method of showing the foregoing items on the profit and loss statement. Emphasize the method of recording interest and discount.
- D. Additional accounts necessary to furnish information for more detailed balance sheet and profit and loss statement.
- E. The desirability of keeping separate accounts with land and buildings.
- F. General principles governing construction of fixed asset accounts, as:
- 1. Depreciation must be considered and shown in a separate account.
  - 2. A fixed asset is always debited for cost of asset when secured, and credited for its cost when disposed of.
- G. Additional accounts:
- 1. Furniture and fixtures.
    - a. Purpose.
    - b. Inventory.
    - c. Depreciation.
    - d. Reserve for depreciation.
  - 2. Real estate—land, buildings.
    - a. Purpose.
    - b. Inventory.
    - c. Building income.
    - d. Building expense.
    - e. Depreciation on buildings.
    - f. Reserve for depreciation.
  - 3. Other fixed asset accounts, as:
    - a. Store fixtures and delivery.
    - b. Equipment.
    - c. Purpose.
    - d. Inventory.
    - e. Depreciation.
    - f. Reserve for depreciation.

4. Interest accounts—interest received and interest paid:
  - a. Purpose.
  - b. Accrued interest.
  - c. Deferred interest.
5. Merchandise accounts:
  - a. Purchases.
    - (1) Returned purchases.
    - (2) Rebates and allowances.
    - (3) Freight-in.
  - b. Sales.
    - (1) Returned sales.
    - (2) Rebates and allowances.
  - c. Inventory.
6. Expense accounts:
  - a. General.
  - b. Selling.
  - c. Administrative.
  - d. Specific expense accounts; as, office salary, office supply, salesmen's salaries, rent paid, freight-out, and so forth.
  - e. Non-operating income and expense accounts, as, purchases, discount and sales discount.
7. Insurance:
  - a. Purpose.
  - b. Importance.
  - c. Unexpired insurance.
8. Capital accounts:
  - a. Partner's capital account.  
Purpose.
  - b. Partner's personal account.  
Purpose.

#### H. Special books and rulings:

Note.—Develop an appreciation of the necessity and purpose of special columns in books of original entry, and teach the best methods of using them.

1. Subdivisions of the journal.
2. Separate columns in books of original entry.
3. Recording in books of original entry.



4. Subsidiary ledgers and controlling accounts.
5. Posting from books of original entry with special columns.
6. Indexing of ledger.

I. Accruals and deferred items:

1. Necessity for consideration.
2. Accrued income.
3. Accrued expenses.
4. Deferred credits to income.
5. Deferred charges to operation.

J. Adjustments and adjusting entries:

1. Necessity for consideration.
2. Determining adjusting entries.
3. Recording adjusting entries.
4. Adjusting entries concerning:
  - a. Insurance.
  - b. Depreciation.
  - c. Bad debts.
  - d. Accrued income.
  - e. Accrued expenses.
  - f. Deferred charges to operations.
  - g. Deferred credits to income.

K. Closing entries:

1. Entries necessary to close the profit and expense accounts into the profit and loss account.
2. The entries to close the profit and loss account into the partner's capital or personal account.
3. Balance the capital account to show the present worth.

L. Additional accounts:

1. Study of consignments and C. O. D. shipments.
2. Relation between consignor and consignee.
3. Accounting with consignments.
  - a. The consignor's entries.
  - b. The consignee's entries.

M. Classification of accounts:

1. Purpose of classification.
2. Classification of asset accounts.

3. Classification of liability accounts.
4. Classification of income accounts.
5. Classification of expense accounts.

N. Analysis and comparative statements:

1. Purpose.
2. Value.
3. Uses.

O. Laboratory work illustrating and applying all principles involved:

1. The business narrative set should involve books of original entry with special columns.
2. The partnership type of business organization should be used.
3. Some definite type of business should be selected.
4. All principles previously involved should be used and practiced in this set.
5. Entries should be made from definite and organized memoranda.

### III. Method:

Use the class method of instruction on the principles involved, being sure that these principles are comprehended before proceeding with the application. Individual instruction should then be given as needed.

Emphasize the importance of neatness and accuracy in the application of principles of bookkeeping through the clerical procedure.

Stress the importance of business-like habits. Develop ideals of honesty and dependability.

Teaching should involve clear, definite, and helpful instruction. It should not degenerate into mere checking of laboratory work. Wherever the solution of problems involves certain reports and the use of forms, teach proper checking and filing of all papers involved, thus bringing in business practice throughout the course.

### IV. Tests:

Tests of the following types should be used: one on the application of the records relative to the operation of the business and the demands of the administration, another on the additional accounting principles and their applications.

**V. Standards:**

Tentative standards shall be:

1. Ability to picture the formation, purpose, operation, and dissolution of partnership types of business.
2. Ability to point out the special principles involved in bookkeeping and accounting in partnership businesses, and to classify accounts.
3. A thorough knowledge of the theory of special columns in books of original entry, controlling accounts, and subsidiary ledger.
4. Ability to prepare and analyze financial statements, adjusting and closing entries involving accruals, deferred items, depreciation and reserves; and comparative statements.
5. Absolute accuracy in calculations.

**VI. Equipment:**

Other than the required furniture and equipment, there should be a recognized make of listing machine, a filing cabinet of some standard size and make, and two standard typewriters in each room where bookkeeping is taught.

**VII. Bibliography:**

Baker, James W.: *Twentieth Century Bookkeeping and Accounting* (complete). Southwestern Publishing Company, 1923.

Finney, J. C.: *Accounting Principles and Bookkeeping Methods*. Henry Holt and Co., 1924.

Jones, Conner T.: *Teaching Business Subjects in the Secondary School*. Ronald Press Co., 1924.

Kester, Roy B.: *Accounting, Theory and Practice* (Vol. 1). Ronald Press Co., 1922.

Koopman-Kester: *Bookkeeping*. Ronald Press, 1922.

McKinsey, J. O.: *Bookkeeping and Accounting*. Southwestern Publishing Company, 1920.

Rosenkampff-Wallace: *Bookkeeping Principles and Practice*. Prentice-Hall, Inc., 1923.

## BOOKKEEPING III

**I. Aims:**

- A. To teach the corporate type of business organization.
- B. To develop the principles of accounting as applied to the corporate type.
- C. To make familiar the more advanced accounting principles and their application.
- D. To enable the pupil to prepare, interpret, and analyze more complicated financial statements.
- E. To teach the use and necessity of special columns in books of original entry, controlling accounts, and auxiliary ledgers.

**II. Content:**

- A. Study of the corporate type of business. Concrete case of corporation, its formation, operation, and dissolution.
  - 1. Characteristics of the corporation.
  - 2. Advantages and disadvantages.
  - 3. Proprietorship shown in shares owned by the stockholders.
  - 4. Classification and study of the different kinds and values of stock.
  - 5. Formation of corporation.
  - 6. Certificate of incorporation.
  - 7. Opening entries.
  - 8. Entries changing from partnership to corporation.
  - 9. Accounts peculiar to the corporation:
    - a. Capital stock.
    - b. Unissued capital stock.
    - c. Treasury stock.
    - d. Surplus.
    - e. Dividends payable.
  - 10. Study of the distribution of profits.
  - 11. Adjusting and closing entries.

Note.—Special emphasis should be placed upon the new accounts and their relation to partnership accounts.
- B. Books and records peculiar to corporation type of business organization:
  - 1. Minute book.
  - 2. Subscription book.
  - 3. Subscribers' ledger.

4. Stock certificate book.
  5. Stock ledger.
  6. Stock transfer book.
- C. The balance sheet as reflecting the financial condition of the business:
1. The analysis of the balance sheet shows:
    - a. Solvency or insolvency of the business.
    - b. The way in which the capital has been invested.
    - c. The relation of the assets and liabilities.
    - d. The financial rating of the business.
    - e. The basis of business management.
  2. Standard form of balance sheet:
    - a. The report and account forms.
    - b. Classification of assets.
      - (1) Current assets.
      - (2) Fixed assets.
      - (3) Deferred assets.
      - (4) Other assets.
    - c. Classification of proprietorship accounts:
      - (1) Current liabilities.
      - (2) Fixed liabilities.
      - (3) Deferred liabilities.
      - (4) Other liabilities.
    - d. Classification of proprietorship accounts:
      - (1) Capital stock.
      - (2) Surplus.
      - (3) Reserves.
      - (4) Undivided profits.
      - (5) Dividends payable.
- D. The profit and loss statement as reflecting the financial progress of the business:
1. The analysis of the profit and loss statement shows:
    - a. The financial progress of the business as to income and expense.
    - b. The volume of the business done during the fiscal period.
    - c. The relation of the income to the expense.

2. Standard form of profit and loss statement:
  - a. The report and account forms.
  - b. Classification of income.
    - (1) Trading.
    - (2) Other operating income.
    - (3) Non-operating income.
    - (4) Interest earned.
    - (5) Purchases discount.
- E. Additional accounts; as, accounts with fixed and intangible assets, mortgages, and bonds payable, trading, and general accounts used in manufacturing.
- F. Laboratory work illustrating and applying principles involved:
  1. The business narrative set should involve books of original entry with special columns relative to controlling accounts, and general and subsidiary ledgers for a corporate business organization of a definite type.
  2. New principles and accounts should be used and practiced in this narrative set.
  3. Entries should be made from definite and organized memoranda.

### III. Methods:

As in the preceding courses, the class method of instruction should be used, care being taken that the principles are comprehended before proceeding with the application. Individual instruction should then be given as needed.

Emphasis should be placed upon analysis of transactions relative to the administrative and accounting departments.

Sufficient drill should be given to establish the principles involved.

### IV. Tests:

Tests should be given on the financial and administrative phases of the corporate type of business organization, and on analysis and the recording of financial occurrences.

### V. Standards:

Tentative standards shall be:

Ability to picture the organization, administration, and operation of the corporate type of business.



Thorough knowledge of the principles of bookkeeping and accounting used in this type of organization.

Ability to prepare and analyze advanced phases of financial statements, especially good will, and statements involving surplus and its distribution.

## **VI. Equipment:**

Other than the required furniture and equipment, each bookkeeping room should be supplied with a standard make of listing machine, a filing cabinet of some standard size and make, two standard typewriters, and a posting machine.

## **VII. Bibliography:**

Baker, James W.: 20th Century Bookkeeping and Accounting (complete). Southwestern Pub. Co., 1923. Business Accounting, Ronald Press Co.

Finney, J. C.: Accounting, Principles and Bookkeeping Methods. Henry Holt and Co., 1924.

Jones, Conner T.: Teaching Business Subjects in the Secondary Schools. Ronald Press Co., 1924.

Kester, Roy B.: Accounting Theory and Practice (Vols. I and II). Ronald Press Co., 1922.

Koopman-Kester: Bookkeeping, Ronald Press Co., 1923.

McKinsey, J. O.: Bookkeeping and Accounting, Southwestern Pub. Co., 1920.

Rosenkampff-Wallace: Bookkeeping. Principles and Practice. Prentice-Hall, Inc., 1923.

## BOOKKEEPING IV

**Aims:**

- a. To help the pupil master financial statements adjusting and closing data and entries, financial records, exhibits, schedules, and so forth.
- b. To familiarize him with with graphs and their application in the preparation of financial statistical data.
- c. To show the relation of accounting to business management.
- d. To study different and more advanced types of financial statements.

**Content:**

- a. Review of the balance sheet:
  1. Single proprietorship.
  2. Partnership.
  3. Corporation.
4. Study of comparisons of the different forms of the balance sheet.
5. Different uses made of the balance sheet:
  - a. Balance sheet desired by long-time creditors.
  - b. Balance sheet desired by short-time creditors.
  - c. Balance sheet desired by governmental agencies.
  - d. Balance sheet desired by stockholders.
6. Use of the condensed balance sheet with supporting schedules.
7. Adjustments, accruals, and inventories.
8. Comparative balance sheets, exhibiting percentages.
9. Use of graphs.
- b. Review of profit and loss statement:
  1. Single proprietorship.
  2. Partnership.
  3. Corporation.
4. Particular emphasis on the various sections of the statement.
- c. Adjustments, accruals, and deferred items:
  1. Adjusting entries.
  2. Closing entries.
- d. Graphic method of presenting accounting facts:
  1. Need and purpose.

2. Method of constructing graphic charts.
  3. Interpretation of charts.
- e. Laboratory work illustrating and applying principles of accounting:
1. Use a series of problems each of which serves definite accounting purposes. Stress the solution of such problems, emphasizing financial and accounting principles. The problems should involve the entire accounting process.

**Methods:**

As in the preceding courses, the class method of instruction should be used, care being taken that the principles are comprehended before proceeding with the application. Individual instruction should then be given as needed.

Emphasis should be placed upon analysis of transactions relative to the administrative and accounting departments. Sufficient drill should be given to establish the principles involved.

**Tests:**

Tests should be given on the financial and administrative phases of the corporate type of business organization, and on analysis and the recording of financial occurrences.

**Standards:**

Tentative standards shall be:

Ability to picture the organization, administration, and operation of the corporate type of business.

Thorough knowledge of the principles of bookkeeping and accounting used in this type of organization.

Ability to prepare and analyze advanced phases of financial statements, especially good will, and statements involving surplus and its distribution.

**Equipment:**

Other than the required furniture and equipment, each bookkeeping room should be supplied with a standard make of listing machine, a filing cabinet of some standard size and make, two standard typewriters, and a posting machine.

**Bibliography:**

Baker, James W.: 20th Century Bookkeeping and Accounting (complete). Southwestern Pub. Co., 1923.

Finney, J. C.: *Accounting, Principles and Bookkeeping Methods*. Henry Holt and Co., 1924.

Jones, Conner T.: *Teaching Business Subjects in the Secondary School*. Ronald Press Co., 1924.

Kester, Roy B.: *Accounting Theory and Practice* (Vols. I and II). Ronald Press Co., 1922.

Koopman-Kester: *Bookkeeping*. Ronald Press Co., 1923.

McKensey, J. O.: *Bookkeeping and Accounting* (Vols. I and II). Southwestern Pub. Co., 1920.

Rosenkampff-Wallace: *Bookkeeping, Principles and Practice*. Prentice-Hall, Inc., 1923.

**OUTLINE**  
**OF**  
**COMMERCIAL SUBJECTS**





## INDUSTRIAL ARTS

At the end of the ninth grade, the student, together with the instructor and parent, should decide what line of work to select and in which to begin training. For the remainder of the high school course the student should specialize in the subject which he has selected.

- (b) "To give knowledge and skill of direct value upon immediate entrance into the trades or trade."

### Grades 10, 11 and 12

#### Function of the Senior High School.

If the junior high school is to be truly and thoroughly prevocational, its promise is that the senior high school will furnish the basis for suitable choice of curriculum and that choice should be the opportunity for specialized training in some one or more vocations. The pupil should come from the junior high school with a fair idea of choice. In the senior high school the student should pursue his work in the chosen fields.

Courses can not be general and special at the same time. Under the usual system of the general or cosmopolitan high school, where everything is based upon subject or subject-department, the present educational values—social, individual and disciplinary—as indicated by their order, can not be attained unless reorganization upon a curriculum basis takes place.

The curriculum or sub-school should have for its function a particular purpose and should represent in miniature the separate special school which attempts a single purpose.

In the place of objectiveless courses with confused and undefined aims, specialized courses must be offered that have a direct relation with all vocations—commercial, professional, industrial, agricultural, domestic economy, etc. Such a system of education would entirely eliminate the present erroneous assumption, that the student who chooses the college preparatory course can make no mistake.

Curriculas in the senior high school "should be those which lend themselves to the resources and organization of the school, which involve a social utility that is undisputed, which meet demands for considerable recruits—which are suitable to the ages and capacities of the high school pupils."

The change from the old (general education) to the new (specialized types of instruction) can not be immediately abandoned because of present controlling convictions, conservative tendencies, student traditions. Present teachers and equipment in many schools are also unsuitable for specialized purpose.

### AIMS

1. The formation of habits which demand neatness, accuracy, perseverance, etc., in connection with mechanical tasks.
2. To give knowledge and develop experience which will make it possible to meet adequate emergencies in industrial matters.
3. To develop initiative, self-reliance, and the power to analyze and plan methods of solving practical problems.
4. To create an appreciation of and a demand for the excellencies of a high type of workmanship, thus raising the standard of living.
5. To create a sense of the appropriateness, and an appreciative response to the value of things commonly contacted.
6. To train boys in performing many unspecialized activities in and about the home.
7. To create such an insight into industry as may lead to the discovery of interests and abilities not known before, thus offering a basis for vocational choice.
8. To develop muscular control and co-ordination that will enable one to perform, with some degree of confidence and satisfaction, the ordinary manipulative tasks required of most men.

**The specific aims of industrial subjects in the senior high school should be such courses as:**

1. Mechanical drawing. Making and reading of working drawings.
2. Woodworking. To acquire a knowledge of the common woods, common woodworking tools, essentials of good construction, and the finishing and care of wood products.
3. Machine shop work. To acquire a knowledge of some of the fundamental factors in machine production and operation, and to appreciate the skills and training of industrial workers.
4. Other kinds of training that may be given where it is possible to obtain the equipment are: Pattern making; forge work; printing; sheet metal work.

## MUSIC AND ART

“The creative spirit is another heart; it will keep us alive if we give it a chance to beat for us; it may be stilled, but there is then no more life.”—HUGHES MEARNES.

The interpretation of life in terms of beauty is one phase of recent educational development. The training that makes it possible to create things of use in forms of beauty, and to reflect beauty through all art forms—such as music—and the plastic arts—is vitally necessary in present day education. The right use of leisure and the higher satisfactions of life demand this training. Therefore, this course of study stresses music and art training.

### ART

The Senior High School student in art and music has already been taught the fundamentals of both subjects and therefore his work in art should be such as to develop:

1. A thorough knowledge, judgment and appreciation of workmanship and of finished products in various fields of art.
2. To acquire a knowledge of vocational opportunities and rewards in art and related fields.
3. To have sufficiently broad technical experience as to lay a good foundation for future specialization.

### MUSIC

#### **Aims:**

To develop ensemble singing, to give opportunity for students of instruments, etc., develop talents and to give them such an understanding of music as will make them appreciators and listeners whether or not they are performers.

The main divisions in High School music are:

1. Chorus.
2. Band and orchestra.
3. Harmony.
4. History and appreciation.



OUTLINE  
OF  
MISCELLANEOUS ITEMS





### MINIMUM FOR HIGH SCHOOL LIBRARY

A good encyclopedia, which, with a standard dictionary, will cost \$100, is the foundation of a high-school library. Competently handled by instructors, it goes far to supply gaps in the various departments. A cheaper, less exhaustive work may be purchased at first and then turned over to the grammar room when finances permit the purchase of a more elaborate work. Encyclopedias soon are classed as out-of-date nowadays; so only very recent editions should be purchased. Another \$100 on general literature will purchase about two hundred volumes. An equal amount must go to science, because books in that field are more expensive. History, civics, and economics can rightly claim \$200.

It is not expected that any school will regard this total of \$500 as either a maximum or minimum amount for a library. It represents a reasonable minimum for four-year high schools to be built up to gradually through annual appropriations distributed among the different lines approximately in the proportions suggested. Until a library is satisfactory, it is entitled to annual additions. Part of the money can suitably go to subscriptions for good periodicals—some general, some of special interest to boys, others that attract girls. The nearer the approach to a community reading-room, open to the public at stated hours, in the absence of a public library, the stronger its support and the greater the sympathy and contact between school and community.

### NORMAL TRAINING COURSE

The following course will be accepted to fulfill the requirements of the certification law for those wishing to take the county examination beginning September, 1925.

Recommendation of the Colorado State Board of Examiners:

Courses which may be given by accredited high schools to meet the requirement for TWO UNITS of professional training required of an applicant for a teachers third grade county certificate, in lieu of the professional training specified in (a) Section 3, Certification Law of 1923.

| Subjects   | Semesters | Number of<br>periods a week,<br>not less than<br>45 minutes<br>in length | Units |
|--|-----------|--|-------|
| 1. General Psychology  | 1         | 5  | 1½    |
| 2. Current Reading<br>Circle books,<br>History, civics,<br>School law of<br>Colorado.  | 1         | 5  | 1½    |
| 3. A composite course<br>consisting of a<br>review of subjects<br>required for a<br>teacher's third grade<br>county certificate,<br>which are not in-<br>cluded in courses 1<br>and 2. | 2         | 5  | 1     |
| Approved methods of<br>teaching each subject<br>should be stressed.  |           |  |       |

### CERTIFICATION OF HIGH SCHOOL TEACHERS

All teachers in legal high schools must hold certificates issued on four years of preparation in a standard college requiring for admission the equivalent of the regular four year high school course. Such preparation shall include courses in education equal to at least one-sixth of the credits required for graduation by the college or colleges attended by the applicant.

The course in education should cover at least three of the following subjects, one of which shall be practice teaching:

- (a) General and educational psychology. \*
- (b) Principles of education. \*
- (c) History of education. \*
- (d) Administration and supervision of education. \*
- (e) Practice teaching. \*
- (f) Special methods. \*
- (g) Philosophy, sociology, anthropology, and biology. \*

**ACCREDITING OF HIGH SCHOOLS**

The accrediting of high schools in Colorado is in charge of the University of Colorado, and any information desired may be obtained by writing to the university. Mr. Charles C. Brown is the present High School Visitor.





*Edwards*

Date Due

|        |   |  |  |
|--------|---|--|--|
| JUL 9  | 4 |  |  |
|        |   |  |  |
| JUL 23 | 4 |  |  |
| NOV 3  | 4 |  |  |





